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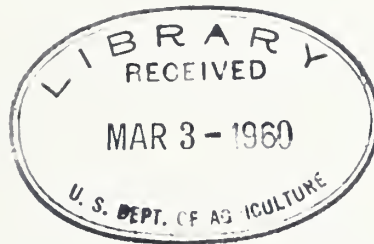


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S
PLANS - Colville
Timber Management
Region One



3
TIMBER MANAGEMENT PLAN ,
COLVILLE WORKING CIRCLE ,
COLVILLE NATIONAL FOREST ,
WASHINGTON //
50 1959 //

FOREST SERVICE

COPY

WASHINGTON, D. C.

Region 1

985847

March 11, 1959

Richard E. McArdle, Chief, By

S-PLANS, R-1, Timber Management - Colville National Forest
Colville Working Circle

The approved original of the timber management plan for the Colville National Forest, submitted with your memorandum of September 8, 1958, is returned.

As indicated in the enclosed review by Timber Management, we feel that this essentially is a good plan, although there are some points which merit further clarification. Please clear up the question of whether or not intermediate cuts are considered a part of the regulated cut during the effective period of this plan.

The Timber Management review and this memorandum should be studied by those who will administer the plan. Copies should be bound in the front of each copy of the plan.

/s/ Edward P. Cliff

Enclosures

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FOREST SERVICE

WASHINGTON, D. C.

The Record

March 11, 1959

L. S. Gross, Forester

S-PLANS, R-1, Timber Management - Colville National Forest
Colville Working Circle

A management plan for the entire Colville National Forest was submitted by Region 1 with memorandum of September 8, 1958. Review of this plan raised some questions which were discussed with the region in several memoranda. During the course of these discussions some features of the plan were clarified. The plan is now in acceptable form.

The entire Colville Forest is treated as one working circle. Each of the five ranger districts is designated as a block. The allowable cut is calculated for the entire forest and divided between the five blocks. The forest supervisor is authorized to shift allowable cut between blocks as needed to maintain a satisfactory timber business.

The working circle includes 824 M acres of commercial forest lands, supporting an estimated 4.4 billion feet of timber. Allowable cut is fixed at 68 MM feet of sawtimber plus 27 MM feet of under-sawtimber-size material, a total of 95 MM feet. There is a limitation on the sawtimber cut which states that not more than 14 MM feet may be ponderosa and white pine.

This plan should be adequate to guide management of the working circle. It is due for revision in 1964. As pointed out in the plan, the larch--Douglas-fir type is the largest forest type on the working circle. Dwarfmistletoe infection is very serious and widespread in this type. Control of this parasite apparently is one of the most promising ways to increase the productivity of the working circle. The control measures advocated in the plan are sound, so far as our present knowledge goes.

Page 22 (Page 19 in reproduction)

I have developed the following tabulation as a means of ready comparison of allowable cut, current growth and the estimated realizable growth from the working circle. All data are reduced to a per-acre basis. The values are shown both in cubic feet and in board feet, converted by the use of the factors developed in the plan.

Allowable Cut, Current Growth and Realizable Growth per Acre 1/

Size Class	AA Cut 1959-1964		Current PAI		Realizable MAI		R-1 TRR ^{4/} Goals
	cu.ft.	bd.ft.	cu.ft.	bd.ft.	cu.ft.	bd.ft.	bd.ft.
Sawtimber 2/	15	83	13	73	21	117	144
Other Products 3/	9	32	6	23	13	48	47
Total	24	115	19	96	34	165	191

1/ Exclusive of intermediate cuttings

2/ 5.6 board feet per cubic foot (2 cords per M)

3/ 3.7 board feet per cubic foot (3 cords per M)

4/ S-PLANS, TM General C/L 6/28/57

It appears from the plan that there is a good possibility of marketing the allowable cut of sawtimber-size material. The demand for other products must increase materially, however, before that segment of the allowable cut can be marketed. The plan prescribes that regeneration will be accomplished by clear cutting in patches or blocks. Thus, until markets for small-size material improve, it appears that a good deal of the "other products" allowable cut may be destroyed incident to rehabilitation of clear-cut areas on which sawtimber has been harvested.

In application of the plan every practicable opportunity to market small-size material for studs, pulpwood or other products must be used.

The allowable cut for the plan period exceeds current annual increment, but is well below the growth which reasonably can be expected after cutting. It is interesting to note (last column of above tabulation) that the estimated realizable growth on this working circle is reasonably close to the average growth needed for all of Region 1 in order to meet the TRR goals for the year 2000.

Page 23 (Page 20 in reproduction)

The discussion of cutting cycles on this page is somewhat confused. When this plan is revised I suggest that more thought be given to the question of regularly recurring cutting cycles. Under even-aged management, forest types with rotations of 120 years or more, on reasonably productive sites, should support intermediate cuts at intervals of 10 to 20 years. The first commercial cut can be scheduled reasonably early if there is a market for small-size material. If only saw logs are marketable, the first intermediate cut would come later in the rotation. It is desirable to recognize the importance of such cuts by scheduling them in all operable stands of selected compartments each year.

I am not quite sure whether the author of the plan intended that the intermediate cuts listed on this page would be included as a part of the regulated allowable cut of the working circle. I did not include intermediate cuts in the tabulation which appears in this review. So far as I can determine, intermediate cuts are not designated as such in the cutting budget which appears in the appendix of the plan. If it is intended that under this plan intermediate cuts will be a part of the regulated cut, then it is important that such cuts be appropriately designated in the cutting budget and in the control records. If, on the other hand, these intermediate cuts are set up as an objective during this plan period, and these cuts are in the nature of improvement and release cuttings which, in effect, result in salvaging potential mortality and do not decrease the volume available for final cutting, perhaps it was intended that such cuttings be unregulated. It seems to me that the regional office should verify this point with the forest.

I recommend approval.

/s/ L. S. Gross

3 cc-R-1

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FOREST SERVICE

MISSOULA, MONTANA

Regional Forester

September 2, 1958

John R. Castles, Forester

S - PLANS - Timber Management Planning - Colville Working Circle

I have reviewed the timber management plan for the Colville Working Circle. This plan considers the entire area of the Colville National Forest as one working circle.

The working circle includes 937,632 acres of national-forest area, of which there are 823,510 acres of nonreserved commercial-forest land. On this nonreserved commercial-forest area is an inventory of 4,421 MM board feet, Scribner, of green sawtimber (11 inches plus d.b.h.). In addition, there are 4,805 M cords of other products (5 inches to 11 inches d.b.h.).

The plan provides for an allowable annual cut of 68.9 MM board feet of green sawtimber, of which 14.0 MM is pine. An additional cut of 82.1 M cords of other products is also included in the regulated cut. This has been converted to 27.3 M board feet, at a ratio of three cords per M.

The allowable sawtimber cut seems reasonable, amounting to 1.7 percent of the present sawtimber volume. This cut amounts to 86 board feet per acre of the presently stocked commercial-forest area. The total allowable annual cut, including other products, when converted on the basis of 3 cords per M, amounts to 120 board feet per acre on the presently stocked commercial national-forest area. This level of cut should be adequate until the working circle is reinventoried and reanalyzed.

The forest was sampled on a basis of two sampling units: that portion of the forest west of the Columbia River as one, and that east of the Columbia as the second. Forest Survey plots were relied upon completely on the west portion, while a considerable amount of supplementing was done in the east portion. A comparison of data indicates no difference between Forest Survey and supplemental plots.

Statistical accuracy of plus or minus five percent of the total cubic volume based on one probability is indicated. Therefore, this inventory meets the accuracy standards to which the present regional inventory effort is directed.

The total allowable annual cut provided in this plan (96.2 MM) is more than double (43.5 MM) that set for the forest in 1949. It is about 28 percent higher than the interim cut set by the region in 1957.

The plan points out several basic problems of management. Among the more important ones for the Colville are the following:

First, tremendous fires have swept the Colville during critical fire years from 1917-1934. Among other important adverse impacts resulting from these burns are some 160,000 acres of overstocked, and 32,000 acres of poorly stocked, saplings, in addition to about 25,000 acres of nonstocked area. Most of the overstocked area is larch--Douglas-fir or lodgepole pine. The problem of obtaining proper stocking and better distribution of age classes by types is a tremendous management job ahead.

Second, access to all stands is becoming more critical with each passing year. Because over three-fourths of the area and volume of the Colville National Forest is of low-value species, a higher than average proportion of access and utilization road construction will be necessary from Federal funds.

Third, fire damage during critical years will always be a major problem to successful forest management in this area. However, fire damage will become less of a problem with better access, better utilization, and better methods of fire fighting.

Fourth, insects and diseases are taking a heavy toll. In particular, dwarfmistletoe in larch, Douglas-fir and lodgepole pine has been seriously limiting productivity potentials. As mature stands are harvested to control insects and diseases, and as young stands are placed under active management, a considerable gain in the productive capacity of this area can be anticipated.

I find that the forest has followed regional guidelines in preparing the plan. It appears to be well conceived and technically accurate. Therefore, I recommend that this plan be approved by the region.

/s/ John R. Castles

cc: Colville
Washington Office

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TIMBER MANAGEMENT PLAN FOR THE COLVILLE WORKING CIRCLE

COLVILLE NATIONAL FOREST

REGION 1, WASHINGTON

1959

Submitted by: /s/ F. W. Cory Date 4/15/58
Timber Staff Officer

Approved by: /s/ Wm. H. Ibenthal Date 4/15/58
Forest Supervisor

Approved by: /s/ Chas. L. Tebbe Date 9/9/58
Regional Forester

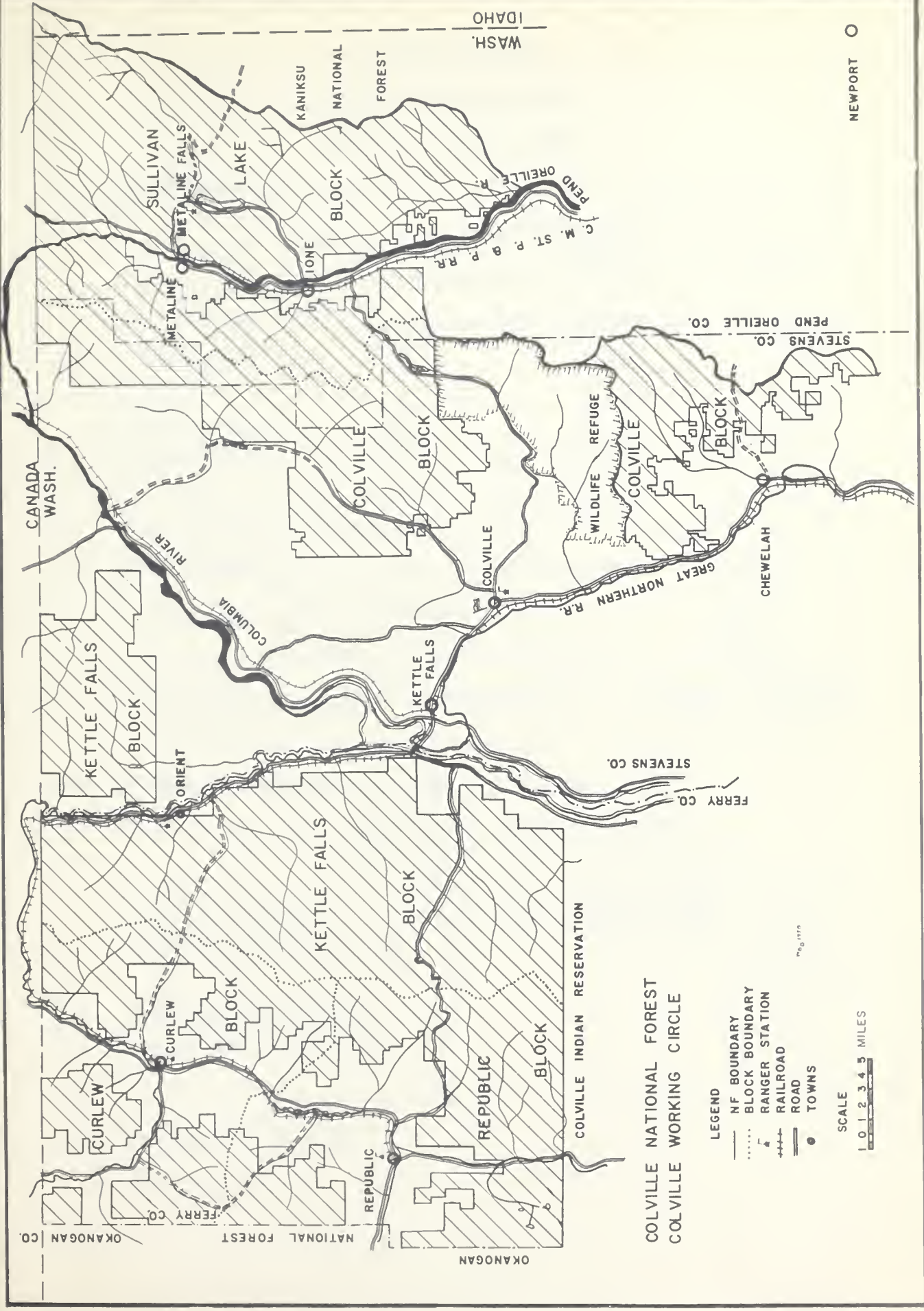
Approved by: /s/ Edward P. Cliff Date 3/17/59
Acting Chief
/s/ LSG

Reviewed by :

	: NATIONAL FOREST ADMINISTRATION			
	: REGIONAL OFFICE		: WASHINGTON OFFICE	
DIVISIONS	: Initials	: Date	: Initials	: Date
Timber Management	: /s/ JRC AGL	9/8/58	: /s/ Ira J. Mason	3/12/59
	: /s/ EB	8/29/58	:	
Recreation and Lands	: /s/ FKS	8/27/58	: /s/ John Sieker	9/29/58
	: /s/ FWJ	5/23/58	: /s/ C. A. Joy	10/7/58
Range and Wildlife Mgt.	: /s/ WWD	5/19/58	: /s/ D. M. Gaufin	10/2/58
	:		:	(Actg.)
Watershed Management	: /s/ GFC	9/10/58	: /s/ G.R. Salmond	10/6/58
	:		: /s/ Merle S.	
Fire Control	: /s/ DRK	6/4/58	: Lowden	9/26/58
	:		:	
Engineering	: /s/ HRJ	8/29/58	: /s/ CTS	10/9/58
	:		: /s/ C.P. Wessela	10/2/58
Blister Rust Control	: /s/ HES	6/2/58	:	(Actg.)
	:		:	
Information & Education	: /s/ EAH	6/25/58	:	

RESEARCH

:	Int. Mtn. Forest and	:	Washington Office
:	Range Exp. Station	:	Branch of Research
:	:	:	:
:	/s/ OLC Jr.	5/12/58	/s/ CEC 10/10/58
:	/s/ DEB	5/14/58	:
:	/s/ OJ	5/12/58	:
:	/s/ CAW	5/27/58	:



COLVILLE NATIONAL FOREST
COLVILLE WORKING CIRCLE

- LEGEND
- NF BOUNDARY
 - BLOCK BOUNDARY
 - RANGER STATION
 - RAILROAD
 - ROAD
 - TOWNS

SCALE
1 0 1 2 3 4 5 MILES

NEWPORT

SUMMARY OF PLAN

COLVILLE WORKING CIRCLE

COLVILLE NATIONAL FOREST

(1) Land Ownership

		Gross Land Area			
Ownership	Nonforest and	Commercial			
	Noncommercial Forest	Forest		Total	
Nat'l Forest	(Area in Acres)				
Nonreserved	110,140	823,510		933,650	
Reserved		3,982		3,982	
Other Federal		1,293		1,293	
State	2,515	27,730		30,245	
Large Private	1,647	26,583		28,230	
Other Private	12,597	84,850		97,447	
Totals	126,899	967,948		1,094,847	

(2) Timber Volumes

					Volumes	
		Sawtimber Volumes			of	
Ownership					Other	
	Pine	Mixed	Totals		Products	
Nat'l Forest	(MM bd. ft. Scribner C)			M cords	MM bd.ft.	
Nonreserved	864	3,557	4,421	4,805	1,600*	

(3) Allowable Annual Cut - National Forest Lands

Annual Cutting Area - 8,740 acres (harvest cuttings)
5,840 acres (intermediate cuttings)

		Pines	Spruce	Other		
Harvest Cuttings	All Species	Cedar	Mixed	Total		
Sawtimber (MM bd. ft. Scr.)	14.0	7.0	47.0	68.0		
Other Products (M cords)				82.81.0*		
				(27.0 MMbm)		
Intermediate Cuttings						
Sawtimber (MM bd. ft.)				11.78		
Other Products (M cords)				27.6*		
				(9.19 MMbm)		

(4) Revision of Plan - 1964

* 3 cords per M bd. ft.

MANAGEMENT PLAN

1. LAND DESCRIPTION

a. Location

The working circle lies at the extreme northeastern corner of the State of Washington next to the Canadian border and the Idaho state line. All drainages in the working circle are direct or indirect tributaries to the Columbia River and Roosevelt Lake formed by the Grand Coulee Dam. The nearest large city is Spokane, Washington, about 80 miles distant from the town of Colville.

b. Boundaries

The working circle includes all of the land within the Colville National Forest boundaries in Stevens, Ferry, and Pend Oreille Counties, Washington. It also includes a small acreage in northwestern Bonner County, Idaho, and another small acreage in southeastern Stevens County, both of which are in the Kaniksu National Forest. It is bounded on the north by Canada and on the west by the Ferry-Okanogan County lines. The Colville Indian Reservation is the south boundary from the Columbia River west. East of Colville the irregular southern boundary extends southward to the Cottonwood Creek area. The Kaniksu National Forest lies along the eastern edge.

c. Subdivisions

The working circle is made up of five blocks, each of which conforms to ranger district boundaries. Each block contains the following number of compartments:

1. Kettle Falls	35
2. Colville	25
3. Curlew	20
4. Republic	21
5. Sullivan Lake	<u>58</u>

Total	159
-------	-----

Compartments vary from 2 to 12 thousand acres in size, and average about 5,100 acres each.

d. Relation to Other Working Circles

The Priest River Working Circle of the Kaniksu National Forest lies immediately to the east of this working circle, but, because it has different outlets for timber, it must be considered a separate entity. The Newport Working Circle of the same forest also is adjacent, and formerly was combined with the Sullivan Lake Block to form one working circle. It has outlets over the same highway and branch railroad line

that serve the Sullivan Lake Block of the Colville Working Circle. However, because each portion is administered by a different forest and because each serves separate communities, they are designated as separate working circles. Working circles to the west of the Colville unit are in another forest and region. The Colville Indian Reservation is to the south of the working circle, and Canada lies to the north.

2. SUMMARY OF RESULTS FROM PREVIOUS PLANS

No approved timber management plan has ever been made for this working circle or any part thereof. In 1947, brief and very general "quickie" plans were prepared to serve as guides in establishing allowable cuts for the various blocks in the working circle. These plans had no formal approval.

3. FOREST DESCRIPTION

a. Land Ownership and Land Classes

The ownership of lands within the working circle is as follows:

TABLE 1 - LAND CLASSIFICATION BY OWNERSHIP

Class of Land	: Nat'l : :Forest :State	:Small : :Priv.	: Large: : Priv.,	: Other: : U.S.:	Total
<u>Forest Land - Nonreserved</u>	:	:	:	:	:
Commercial Forest	:823,510:	27,730:	84,850:	26,533:	1,293:
Noncommercial Forest	: 62,388:	2,132:	6,451:	1,550:	:
<u>Forest Land - Reserved</u> ^{1/}	:	:	:	:	:
Commercial	: 3,982:	:	:	:	:
<u>Nonforest</u>	: 47,752:	383:	6,146:	97:	:
Total Land Area	:937,632:	30,245:	97,447:	28,230:	1,293:
Percent	: 85.6 :	2.8 :	8.9 :	2.6 :	0.1 :
					100.0

Note: This includes all lands within the forest boundary and certain other lands outside the forest boundary north and east of the Pend Oreille River and north of Section 17, T. 37 N., R. 43 E., W.M., and the west side of the Pend Oreille River north of Section 10, T. 39 N., R. 43 E., W.M.

^{1/} This acreage consists of lands reserved for present and proposed campgrounds, power lines, roadside zones and other special uses. See Coordination of Uses (Rec.) and appendix map.

b. General

The forested area extends from the bottom lands of the major river drainages to the top of the main divides between them. The higher elevations support scattered stands of timber that, due to terrain, are not suitable for harvesting operations at the present time. This high elevation timberland is extremely valuable for watershed protection.

There have been large burns in the Sullivan Lake, Colville, and Kettle Falls Blocks of the working circle. Most of them occurred in the late twenties and early thirties, and most of them are restocking except where reburns have occurred or where the top soil is too shallow to support tree growth. Burned areas are characterized by numerous scattered pockets of mature timber which, in many cases, do not have sufficient volumes of timber to finance the building of the main roads needed to open up the entire drainage.

c. Forest Types

Forest types vary from dry-land species in the western part of the working circle to moisture-loving combinations of species in the eastern portion. For inventory purposes, all stands were classified according to type following Forest Survey inventory and supplementary timber management planning instructions for Region 1.^{1/} Descriptions of the major types recognized are as follows:

(1) Larch---Douglas-fir

This type predominates throughout the working circle. The two principal species are usually mixed together in different proportions, but any of the other species found in the area may also be in association. The stands are usually even-aged, but their ability to withstand fire has caused some stands to be two-storied. On many of the burned-over areas where lodgepole pine had originally become established, larch and Douglas-fir are beginning to appear and dominate the other species.

A recent survey by the Inland Empire Research Center for dwarf-mistletoe showed 75-90 percent of the sawtimber, 50-75 percent of the pole-size, and 30-60 percent of the seedling and sapling larch---Douglas-fir to be infected with mistletoe. The Sullivan Lake Block was not included but is known to be infected also. (See table 11 appended.)

It is expected the acreage of this type will increase as more intensive management and control of the dwarfmistletoe is practiced.

^{1/} Manual of Field Instructions for Forest Inventory, Rocky Mountain Region Circular Letter of May 9, 1955, S-PLANS-T.M. Planning-Preparing Type Maps.

(5) Cedar and Hemlock-Grand Fir

This type likewise occurs mainly in the Sullivan Lake Block. It is found in the bottom lands bordering the main streams and at the lower elevations. In many areas it is very decadent due to over-maturity. There is little demand at present for whatever merchantable materials it contains.

Younger stands of cedar poles are in big demand, but they are very limited in area. Cedar will be favored wherever possible, and in some areas will be planted.

When these stands are opened up by partial cutting, hemlock has a tendency to crowd out all other reproduction. It is probable that the acreage of these types will increase on the Sullivan Lake Block as white pine and spruce are removed.

(6) Lodgepole Pine

This type has come in extensively on many of the burned-over areas. It now makes up 16 percent of the commercial-forest type. In practically all cases it is even-aged, and much of it has become stagnated from overstocking. It is anticipated that at least one-half of the area will be replaced by other species. Larch and Douglas-fir are already beginning to overtop the lodgepole in some areas. On other areas of fairly good site qualities, it is expected that as the mature lodgepole is cut, other species will be established.

d. Growing Stock

Distribution of growing stock by types, size classes and ownership, as indicated in table 2, shows important relationships. It indicates that larch--Douglas-fir is the major forest type for the working circle, making up 66.6 percent of the commercial-forest timber stand.

The size-class distribution is poor and in need of adjustment. Saw-timber, most of which is overripe and decadent, makes up 55 percent of the stand. Pole-size classes are deficient, making up only 14 percent of the total. Seedling and sapling stands make up 28 percent, and nonstocked, 3 percent. The present inventory data does not give reliable age-class information, but it is obvious that a better age-class balance is needed.

Stocking is not particularly good. Many stands are stagnated because of overstocking in seedling and sapling size classes. Others are understocked to various degrees. About 24,908 acres are nonstocked (less than 10 percent stocking). Some of these areas could be replanted, but most are in need of brush eradication before planting can be undertaken.

TABLE 2 - COMMERCIAL FOREST LANDS (NONRESERVED)
BY OWNERSHIP, TYPE & SIZE CLASS

Type	Saw- timber	Poles	Seeds. & Saps.	Sub- total	Non- stocked	Total	Per- cent
-----Area in Acres-----							
<u>NATIONAL FOREST</u>							
White Pine	6,072	691	1,236	7,999		7,999	1.0
Ponderosa Pine	75,533	422	6,905	82,860	8,000	90,860	11.0
Lodgepole Pine		40,426	89,151	129,577	4,500	134,077	16.3
Larch	174,558	34,741	116,518	325,817	6,000	331,817	40.3
Douglas-fir	159,514	35,006	8,281	202,801	6,000	208,801	25.4
Alpine fir	8,693	4,398	6,790	19,881	204	20,085	2.4
Cedar-Hemlock	13,766	80	111	13,957		13,957	1.7
Spruce	14,534		1,089	15,623	204	15,827	1.9
Hardwood	87			87		87	
Tot. Nat'l For.	452,757	115,764	230,031	798,602	24,908	823,510	
Percent	55	14	28		3		100.0
<u>PRIVATE</u>							
All Types	49,287	12,154	20,998	82,439	2,411	84,850	
<u>STATE</u>							
All Types	15,721	4,400	6,712	26,833	897	27,730	
<u>LARGE PRIVATE</u>							
All Types	11,405	4,886	9,572	25,863	720	26,583	
<u>OTHER U.S.</u>							
All Types	690	567	36	1,293		1,293	
Tot. All Other	77,103	22,007	37,318	136,428	4,028	140,456	
GRAND TOTAL	529,860	137,771	267,399	935,030	28,936	963,966	
Percent	55	14	28	97	3		100.0

TABLE 2a - STOCKED COMMERCIAL FOREST LANDS (NONRESERVED) BY TYPE, SIZE CLASS & DENSITY

NATIONAL FOREST

Forest Types	Sawtimber			Poles			Seedlings and Saplings			Total			Total All Size Classes
	Well	Medium	Poor	Well	Medium	Poor	Well	Medium	Poor	Well	Medium	Poor	
	-Area in Acres-												
W. Pine	1288	3491	1293	574	55	62	942	116	178	2804	3662	1533	7999
P. Pine	8883	33652	32998	252	135	35	664	2039	4202	9799	35826	37235	82863
LP. Pine				34066	3820	2540	70735	9609	8807	104801	13429	11347	129577
L-DF	111697	154575	67800	42603	20259	6885	86241	23649	14909	240541	198483	89594	528618
S-AF	10699	9659	2869	1738	1530	1130	1570	1832	4477	14007	13021	8476	35504
C-H-GF	5877	6631	1258	80			105		6	6062	6631	1264	13957
Hdw.		87								87			87
Total	138444	208095	106218	79313	25799	10652	160257	37245	32579	378014	271139	149449	798602
Percent										47	34	19	100

SITE QUALITIES

Forest Type	Percent			Average
	Good	Medium	Poor	
Western larch	25	50	25	III
Douglas-fir	15	42	43	IV
Ponderosa pine	23	48	29	IV
White pine	77	23		II-III
Cedar-Hemlock	34	50	16	II-III
Lodgepole pine	36	63	1	III

Site qualities by types are shown in table 2a. In the eastern portion of the working circle the site qualities are better, on the whole, than those in the western portion. Thriftiness is generally poor due to the predominance of overripe sawtimber stands. In many of the old burns, stocking is too dense for good growth and thrift. Thinning and weeding are needed on a wide scale.

Appendix table 1 shows the commercial-forest area of national-forest lands (nonreserved) by type, strata, and blocks. The type strata shown here are all forest condition classes recognized in the inventory and recognizable on aerial photographs of the area.

e. Volumes

Volumes in the primary growing stock are shown in tables 2 and 3 appended, and table 3 following. Table 2 shows net board-foot volumes (Scribner C) for trees 11" d.b.h. and larger. A total of 4,421 MM board feet, plus or minus 309 MM (or 7 percent for 1 S.D.), is estimated to exist on all nonreserved national-forest lands. The volume in other ownership is estimated to be 637 MM board feet. The mature timber stands are becoming depleted on lands of other ownership, both inside and outside the forest boundaries. Immature timber is being marketed from these areas. Table 3 is a breakdown of area and board-foot volume into type strata.

Table 3 shows sawtimber volumes by blocks, as well as species distribution in each. White pine makes up 3.7 percent of the volume and is found mainly in the Colville and Sullivan Lake Blocks. Ponderosa pine makes up 13 percent of the volume, with Kettle Falls, Colville, and Republic Blocks having the main volume of this species. Larch--Douglas-fir makes up 62.8 percent of the total volume and is quite well distributed throughout the blocks. Cedar, hemlock, grand fir, spruce and alpine fir amount to 17.5 percent, with the bulk of this volume in the Sullivan Lake Block.

The inventory also shows volumes in terms of cubic feet for two separate portions of the growing stock -- that in pole-size trees between 5" and 11" d.b.h., and that in sawtimber trees over 11" d.b.h. Cubic volumes in pole trees are shown in appended table 4, cubic volumes in sawtimber trees appear in table 4a, and the total for both sawtimber and poles in table 4b. Together they make up the total measurable growing stock. All show volumes inside the bark between a 1-foot stump and a 4-inch top. Small trees under sawtimber size make up a part of the usable volume. Much of this volume will probably be utilized as pulpwood, poles, and other miscellaneous forest products.

It is important to realize that not all of the pole volume is actually available for cutting. In mature stands it is ready for harvest, assuming clear cutting is practiced. A certain portion of the volume

of immature stands can also be cut. In young stands, however, the larger part of the growing stock must be retained as crop trees. This has been estimated to vary between 60 percent to 80 percent, depending on circumstances. Appendix table 2 and table 4 represent all of the merchantable growing stock--the larger material in board feet and the smaller material in cubic feet and cords.

As is indicated in appendix table 2, national-forest lands contain the major portion of all timber volumes considered to be in the working circle. There is a considerable acreage and volume of timber (in small sizes) outside of the working circle. However, that can and will contribute to the support of local industry. With few exceptions, these private lands have been cut over at least once.

In addition to the merchantable green material, there are over two million cords of salvable dead and cull material on the national forest (see table 4). Little of this volume is usable for anything other than fuelwood or low value pulpwood. It is also very perishable. Unless utilization of this material becomes very much greater than it is at present, which is practically nil, the volume can be considered to remain about static. As present volumes disappear, they will be replenished by mortality.

TABLE 3 - SAWTIMBER VOLUMES BY SPECIES AND BLOCKS FOR
COMMERCIAL NATIONAL FOREST LANDS (NONRESERVED)

Species	Blocks					Total	Percent
	Colville	Kettle Falls	Curlew	Republic	Sullivan Lake		
	- - - -	- - - M	bd. ft.	(Scribner	C)	- - - -	
WP	33,143	-	-	-	130,900	164,043	3.7
PP	132,850	222,732	47,977	133,714	38,288	575,561	13.0
LPP	60,540	19,427	3,232	4,779	36,423	124,401	2.8
L-DF	495,980	871,544	551,796	518,905	341,455	2,779,680	62.8
S-AF	12,942	78,820	61,370	42,150	260,128	455,410	10.3
C-H-GF	66,574	25,489	16,758	10,495	201,902	321,218	7.2
Hdw.	233	-	-	-	825	1,058	.2
Total	802,262	1,218,012	681,133	710,043	1,009,921	4,421,371	100.0
Other Products*	399,983	303,988	207,992	191,992	455,980	1,599,935	
Percent	18	28	15	16	23	100	

*Board foot volumes of other products (under sawtimber size) are conversion volumes using 333 board feet per standard cord.

TABLE 4 - SALVABLE VOLUMES IN CULL AND DEAD TREES

BY BLOCKS AND TYPES

NATIONAL FOREST									
		Volume by Species							
No.	Blocks	WP	PP	Larch	DF	C-H-GF	S-AF	Total	Percent
		- -	- - -	- - - -	M Cords	- -	- - -	- - - -	
1 -	Colville	-	42	239	146	3	3	433	19.4
2 -	Kettle Falls	-	58	328	123	17	17	543	24.5
3 -	Curlew	-	11	163	112	-	8	294	13.2
4 -	Republic	-	33	109	144	-	5	291	13.1
5 -	Sullivan Lake	33	8	120	114	235	152	662	29.8
TOTAL		33	152	959	639	255	185	2,223	100.0

Appendix table 9 shows average usable cull and dead trees.

Appendix table 9a shows usable cull in cords for national forest.

4. MANAGEMENT OBJECTIVES

a. Community Stabilization

(1) Through better management practices, bring all commercial timber areas up to their maximum growing potentials and thereby provide industry with an opportunity to obtain a steady supply of raw materials.

(2) Encourage the establishment of remanufacturing facilities or new industries which will fully utilize the allowable cut of all wood products to the highest degree.

(3) Discourage the establishment of logging camps or other temporary communities within the forest.

(4) Stevens County has been selected as the pilot county in the State of Washington for the Rural Resource Development Program. The Forest Service has an active part in this program. The development of the working circle will be vital to the success of this departmental program.

b. Marketing Program

(1) Prepare and program sales primarily of deteriorating timber, to meet urgent silviculture conditions and improve growing stock.

(2) To the degree possible, design sales to meet the needs of wood products industries.

(3) Markets will be sought and developed for little-used products now going to waste.

c. Silviculture

The current regional marking guides^{1/} will be applied to each forest type found in the working circle. These instructions will be modified as needed to coincide with prior uses or policies applying to municipal watersheds.

(1) Even-aged management practices will be applied in all types.

(2) On ponderosa pine sites, the silvicultural objective will be to re-establish this species. Thrifty ponderosa pine stands will be cut on a risk-class basis the first time over, followed later by a harvest cut to fully establish new stands. Overmature and high-risk stands will be cut clean. Wherever possible, cutting will be on a unit-area-control basis.

(3) The silvicultural objective in the larch--Douglas-fir type, by far the largest type in the working circle, will be to control and eliminate dwarfmistletoe which is prevalent in all age classes. To prevent mistletoe re-infecting adjoining cutover areas, severely infected trees will be removed from roadside zones, recreation areas, and streamside zones either at the time adjacent areas are logged or as separate projects. In these specific areas, extreme care must be used to preserve their special values to the fullest extent possible. Block clear cutting will serve best to control dwarfmistletoe on other areas.

(4) In cedar and western hemlock stands which are largely overmature and decadent, the objective will be to utilize this class of material as markets are found. Establishment of cedar in preference to hemlock is desired. The more desirable species can be favored by block clear cutting and broadcast burning to expose mineral soil.

(5) The spruce stands also are desirable but must be handled with care because they are subject to windthrow. The species will be re-established on appropriate sites by applying about the same treatment outlined for cedar-hemlock stands.

(6) Lodgepole pine is mainly a transitory type. Where sites are favorable to other species, silvicultural measures will be applied to favor these species. It may require most of a rotation to convert these areas to other desirable types.

(7) White pine is found scattered over most of the Sullivan Lake Block, but only those areas that show a favorable cost-value ratio will be dedicated to the production of white pine and be placed under the blister rust control program. In these areas, the

^{1/}Current Region One marking guides for ponderosa pine, Douglas-fir, western larch, lodgepole pine, all of June 1957, and western pine, of February 1957. Copies appended.

silvicultural objective will be to follow practices that favor white pine and control of blister rust. At the present time the Tiger Hill, Muddy Creek, and Stony Creek units are the only areas within the blister rust control program.

d. Growing Stock

The major objective will be to gain full utilization of the land potential. Except in reburns and on extremely severe sites, medium to well-stocked young growth is present. In order to bring the entire working circle into full productivity without disrupting the local economy, it is planned:

- (1) To obtain a good age-class distribution by the end of the rotation and, if possible, well-stocked conditions by year 2000. This will be accomplished by cutting mature timber, planting understocked areas, removal of diseased trees, and giving adequate protection. The ultimate goal is a full, disease-free stand on all sites suitable for growing timber. A part of the action taken to secure better stocking, and probably the most important part, will be a reduction in stocking of overstocked stands.
- (2) To extend the cut of mature timber over a period of years until the present poles, seedlings, and saplings can be harvested at a sustained rate.
- (3) To reforest all nonstocked and poorly stocked commercial forest on medium and good sites as promptly as possible.

e. Forest Development

- (1) One of the major objectives of this plan is to make all timber stands within the working circle accessible by suitable roads. To do so, the timber access road system must be completed as soon as possible.
- (2) Within the acquisition policies currently in effect, national-forest ownerships will be consolidated within planned consolidation units inside the forest boundary.
- (3) Continue surface rights determination under the revised mining laws until the entire working circle is covered.
- (4) Correlate timber management practices in winter deer range with wildlife management plans to provide protection and food for deer insofar as possible.
- (5) Continue to meet regional fire control standards and follow approved slash disposal methods. Provide supplemental protection in lieu of slash disposal as needed.

(6) Continue to be alert to all insect and disease infestation and plan measures for control. Take full advantage of opportunities to sell merchantable, infested and infected materials to keep outbreaks in the endemic stage.

f. Sustained Yield

Establish from time to time the maximum amount of timber that may be cut annually from national-forest lands and hold cutting within these limits.

5. COORDINATION WITH OTHER USES

Timber management practices on national-forest land will be correlated with other uses. If other uses are of prior importance, it may be necessary to modify the timber use to harmonize with them.

a. Water

Watershed management is especially important in this working circle as it drains directly into Roosevelt Lake, which is formed by the Grand Coulee Dam.

- (1) Silvicultural systems that favor maximum water storage and gradual runoffs will be used.
- (2) Logging plans and timber sale contracts will provide methods and practices which will minimize surface runoffs, erosion, and damage to streams.
- (3) Prescribed burning will be limited to situations that will not cause damage to water resources.
- (4) Proper precautions will be taken in logging and road construction to prevent erosion and stream pollution.
- (5) Domestic water is obtained from streams originating within the working circle for several small communities and towns in and adjacent to this working circle. In the larger watersheds, domestic plans will be made for municipal watershed protection, and, in all watersheds where domestic water is obtained, logging operation will be modified as necessary to provide the maximum protection to the water quality.

b. Recreation

Cutting and logging operations will be carefully planned and closely supervised to recognize and protect recreational values. All trees that are hazardous, because of conditions making them likely to break or fall, will be removed from recreational areas prior to development with the least amount of disturbance to the site. Along stream and roadside zones, logging operations will be carefully planned and supervised to provide the minimum disturbance to the soil

and low vegetative cover. This will include such measures as skidding logs to landings away from roads or streams, or use of jammer skidding or horse log-skidding in preference to dozer skidding.

Additional places suitable for recreational area development will be found and developed to meet future needs. Timber stands on recreation areas and those designed for future recreation areas will be managed in accordance with the servicewide policy entitled, "Management of Timber Stands for Recreation." Reference: Washington Office, C/L #324 of April 16, 1957. The plan shows 3,982 acres as forest reserve areas. This covers 426 acres reserved in powerlines, 250 acres in campground and recreational areas, 2,642 acres in road and roadside zones, and 664 acres in other special uses. These areas either have the timber removed by actual occupancy, or they have the timber reserved for special purposes.

c. Wildlife

In most of the area, normal timber management practices will improve wildlife habitat. Numerous patch cuttings will create a greater amount of "edge" conditions and will increase forage production for big game and upland game birds. Through care in design and location of patch-cut areas, good shelter cover can be provided adjacent to open patch cuttings. Unless good shelter cover is provided, much of the present marginal winter range will become submarginal for deer and grouse.

Two critical game winter range areas are now recognized: Sherman Creek and Sullivan Mountain. It is believed that commercial timber production on them will result in, and make for, the best game habitat maintenance and improvement. Preliminary observations indicate, however, that except for snow pockets there is little chance of re-establishing conifer reproduction without deerproof fencing.

To safeguard favorable conditions of waterflow in the management of the national-forest resources, every reasonable effort should be made to preserve the natural condition of logging areas, with particular attention to streambeds, streamside vegetation, and meadows. Ordinarily, with proper logging methods, the forest cover remaining after prescribed cutting may be expected to protect the watershed. In some extreme cases, however, logging on unfavorable soils and topography will result in serious erosion and adverse water yields so will not be planned. If openings are to be made, the possible influence on water makes it more essential that sound and adequate plans be made for the prompt restoration of a forest cover before cutting is authorized.

d. Grazing

Grazing is carried on within all blocks of the working circle. Timber stands of the lesser densities, containing open grassy meadows, south slopes, brush areas, etc., furnish the primary range for cattle. The bulk of the livestock is grazed in the more open westerly portion of the working circle rather than in the eastern part, which has denser timber stands.

There were 144 cattle permittees who grazed 5,691 cattle on the working circle in 1956. Two sheep permittees grazed 2,250 head of sheep within the working circle during the same period.

For the most part, grazing use and timber use have been compatible with each other. Cutting in many areas has provided primary forage for livestock on land which has provided no feed or has been secondary range until the timber crop was harvested. In some areas used for grazing, it will be necessary to control livestock use until plantations are established.

e. Mining

Minerals are found scattered throughout the area. Gold and silver are mined near Republic; zinc, lead, copper, and silver near Colville and Metaline Falls; and magnesite near Chewelah. A cement plant is operated at Metaline Falls. Other minerals are also known to be in the area.

Radioactive minerals discovered in Nancy Creek, Sherman Pass, and St. Peter's Creek caused a rush to stake uranium claims all over the working circle beginning in 1954. Thousands of claims were located prior to the revision of the mining law in July, 1955.

Although no serious interference with resource management has occurred to date, the large number of claims predating July, 1955, is a threat to orderly management. Surface-rights-determination procedure has been started. It is planned to cover the entire working circle before the first revision of this plan.

6. REGULATION

a. Rotation

The best sources of information available pertaining to rotation age are the yield tables produced by the Forest and Range Experiment Stations for this region and Region 6. For purposes of this plan, the best rotation age is based on the culmination of the mean annual increment for each species, based on the International 1/8-Inch Log Rule. The culmination of the mean annual increment for the various types in this area is as follows:

Western larch	140 years
Douglas-fir	140 years
Ponderosa pine	140 years
White pine	120 years
Lodgepole pine	100 years
Cedar-Hemlock	120 years
Spruce-Alpine fir	130 years

b. Growth and Mortality

Net growth in board feet is low. A large percentage of the sawtimber acreage is mature and overmature, which contributes little or nothing to net growth.

Various epidemics and other catastrophies have also drastically affected growth rates and the present volume of growing stock. The tussock moth epidemic in 1934, the large fires in the late twenties and early thirties, the spruce bark beetle infestation in the past few years, and dwarf-mistletoe in larch and Douglas-fir stands have caused serious loss of merchantable volume in the working circle during the past 30 years and corresponding loss of growth. The principal loss associated with dwarfmistletoe is in growth rather than mortality.

An indication of current and potential growth can be determined by applying yield table data to local conditions of site, age class, and densities. This has been done in appendix tables 6, 6a, and 6b. Site qualities indicated by the Forest Survey in this area average about medium (see table 2a), but there is considerable variation by types. Present and potential growth rates for national-forest lands as determined by these tables are shown in table 5.

TABLE 5 - NET GROWTH OF ALL SPECIES

NATIONAL FOREST

	Present Growth (Periodic Annual)		Potential Growth (Mean Annual)			
	All		Normal		Realizable-70% Normal	
	Sawtimber	Products	Sawtimber	Products	Sawtimber	Products
	<u>Bd. Ft.</u>	<u>Cu. Ft.</u>	<u>Bd. Ft.</u>	<u>Cu. Ft.</u>	<u>Bd. Ft.</u>	<u>Cu. Ft.</u>
Total	60.3 MM	21.8 MM	138.2 MM	40.0 MM	96.7 MM	28.0 MM
Per Acre	73	26	168	49	117	34

Table 5 shows that the present periodic annual growth is 60.3 MM bd. ft. of sawtimber and 21.8 MM cu. ft. of all products, with an indicated mean annual (realizable) growth of 96.7 MM bd. ft. and 28.0 MM cu. ft. The above growth rates reflect losses due to normal mortality and defect and are apart from any catastrophic losses from fire and widespread epidemics.

Growth on other ownerships is not known. Site qualities on other ownerships are believed to be better than on the national forest, and age classes are younger, but offsetting this is the poor stocking generally found on cutover private lands.

Potential growth rates are considerably greater than present rates. If age classes were brought into better balance and stocking on all areas raised to well stocked condition (70 percent of normal), the growth and allowable cut could be near 100 million board feet of sawtimber and about 100,000 cords of other products per year.

c. Cutting Cycles

No cutting cycles or methods of cutting will be adopted which will lead the production of uneven-aged stands. In this region, uneven-aged stands usually mean stands of undesirable composition. The object in this working circle is to grow even-aged stands made up primarily of intolerant species. These species usually are the most desirable.

To obtain the most out of relatively dense even-aged stands, repeated light cuttings are desirable to give residual trees more room to grow, and to capture mortality which might otherwise be lost. In young stands short of rotation age, such treatments would be in the nature of weedings, thinnings, and intermediate cuttings. In stands over rotation age, they would be improvement and sanitation cuttings. In all instances the volume removed would be light--not to exceed 25 percent of the existing basal area--else reproduction of undesirable species would occur, and uneven-aged stand conditions would develop.

Light cuttings in older stands are mainly to capture mortality. Not much growth response can be expected, but the interval between cuttings should coincide as nearly as possible with the period of best growth response. In ponderosa pine, this is between 15 and 20 years. Repeated cutting on such areas will be spaced accordingly.

Since insect infestations in the older stands, and high-risk patterns which invite them, usually occur as concentrations on small areas, cuttings to remove the infested trees will be patchwise and clear. This in turn should result in even-aged, new stands on small areas.

Intermediate cuttings may be commercial or noncommercial. As a rule, no commercial cuttings will be possible before stands reach about one-half the rotation age. Prior to that, tree sizes generally are too small to yield salable products. For the major portion of the young sawtimber acreage, intermediate cuttings can start at about 70 years and continue at 20-year intervals until the stands are mature. For the lodgepole pine type, only one commercial intermediate cutting is considered practicable, owing to the short rotation age.

As a rule, only well-stocked young stands (such stands generally are overstocked) can be given intermediate cuttings. The growing stock is usually deficient in medium- and poorly-stocked stands. Good stocking conditions should be preserved throughout the period that intermediate cuttings are in progress.

Demand for small sized products has been increasing rapidly in the Colville area through the establishment of stud mills. A pulpwood market to local and west coast mills also is in prospect. Thus, it is probable that commercial intermediate cuttings are going to increase materially over the present rate in the next decade.

d. Cutting Methods

The latest regional instructions will be followed in marking stands to be harvested. The objective will be to establish an adequate transportation system so that proper intermediate and salvage cuts can be made to control insects, mistletoe, pole blight, and any other disease that occurs. This will also involve clear cutting of most of the overripe, decadent, and diseased stands. Whenever economically feasible, release cutting will be done in pole-sized lodgepole pine stands to release larch and Douglas-fir found in association.

e. Allowable Cut

The allowable cut for the working circle is based on the removal of green sawtimber, plus the removal of such merchantable pole sized timber as not required for crop trees.

Area control seems to be the most applicable form of regulation at this time, and the formula most applicable to the inventory data is the Kemp formula. Application of this formula to the area and volume data in each type indicates an allowable annual cut of 69 million board feet and 82 thousand cords of other products. (See appended tables 5 and 5a.) Results by this formula were checked by several volume regulation formulae in appended tables 5b, c, and d, and they were compared in table 6 on page 22. All are in reasonably close agreement with Kemp formula results, indicating that Kemp formula volumes may be used as the allowable cut for the working circle.

It is not sufficient to limit the total cut of all species; limitations must be placed on the cut of individual species or groups of species currently in heavy demand. It is particularly necessary to limit cutting of pine, since demand is such that the volume of these species would soon be exhausted if all the allowable cut were concentrated on it. If the allowable cuts of pine and all species are held within bounds, the repercussions on local economy will not be serious. It is not practicable to indicate the cut by species from intermediate cuttings at this time. Since operating and marketing conditions may not permit cutting precisely at rates specified in table 7, the rate of cutting for each critical sawtimber category and for other products may be exceeded by as much as 25 percent in one year, providing the total cut in a 10-year period is not exceeded by more than 5 percent. Undercuts may be accumulated by decades or until the plan is revised, but liquidation of any accumulation will be subject to the 25 percent overcut limitation.

TABLE 6 - ALLOWABLE CUT OF SAWTIMBER AND OTHER PRODUCTS

ACCORDING TO VARIOUS REGULATORY METHODS

NATIONAL FOREST LANDS

Regulatory Method	Sawtimber MM b. m.	Other Products			Total MM b. m.	Annual Cutting Area Acres
		M cu. ft.	M cords	MM b. m.		
		-Harvest Cuttings-				
Kemp	68.6	7,362	81.8	27.2	95.8	8,741*
Austrian	62.0	Not Est.	Not Est.	Not Est.		6,859
Hanzlik	66.8	" "	" "	" "		6,828
Von Mantel	63.7	6,228	69.2	23.1	86.8	6,501
Von Mantel (Mod.)	81.2	7,927	88.1	29.3	110.5	8,272
		-Intermediate Cuttings-				
Indicated	11.8		27.58	9.2	21.0	5,840
		-Allowable Annual Cut from Harvest Cuttings-				
Recommended	68.0	7,360	82.0	27.0	95.0	8,740

*Includes 1,180 acres on which other products only are available.

TABLE 7 - ALLOWABLE ANNUAL CUT OF HARVEST AND INTERMEDIATE CUTTINGS

BY BLOCKS AND RANGER DISTRICTS

NATIONAL FOREST

Block or Ranger District	Harvest Cuttings						Intermediate Cut			
	Sawtimber			Other Products			Sawtimber		Other Products	
	All	Cedar	Other	Total	(Sound Green)		MM		M	MM
	Pine	Spr.	Mixed	MM	%	M cords	MM b. m.	b. m.	cords	b. m.
Colville	3.5	.3	8.2	12.0	18	20.5	6.8	3.3	8.3	3.0
Kettle	3.8	1.4	13.8	19.0	28	15.6	5.2	2.0	4.0	1.2
Curlew	.9	1.0	8.1	10.0	15	10.8	3.6	1.0	3.0	1.0
Republic	2.4	.7	7.9	11.0	16	9.8	3.3	1.0	3.0	1.0
Sullivan	3.4	3.6	9.0	16.0	23	25.3	8.1	4.5	9.3	3.0
Total	14.0	7.0	47.0	68.0	100	82.0	27.0	11.8	27.6	9.2

The allowable cut of "salvage" products has not been determined, nor is regulation of these volumes planned. The perishable nature of these materials makes it desirable to harvest them in unlimited quantities as soon as possible. For information on quantities available, see table 4.

Cutting control will apply primarily to the working circle, but, since administrative control is by ranger districts which are blocks of the working circle, allowable cuts by districts are desirable. Table 7 shows an apportionment of the cut on the basis of present merchantable volume in each block. This must be regarded as temporary and subject to revision by the forest supervisor at any time to meet cutting needs throughout the working circle. At the same time, it is well to remember that the volume estimate by blocks (districts), which is the basis of apportionment, is subject to greater error, species by species, than for the working circle.

Should any substantial amount of the sound sawtimber volume be harvested as pulpwood or other products, such quantities must be charged against the sawtimber allowable cuts rather than against other products. A considerable part of the hemlock, grand fir, alpine fir, and lodgepole pine volumes is apt to be utilized that way.

No attempt is made to indicate the sustained cut from other ownerships within the forest, since they are closely linked with large acreages of other ownerships outside the forest boundary.

The established sawmill capacity in areas adjacent to the working circle is 165 million board feet per year (see list on page 38). Of this, the national forest is able to supply only 79 million board feet of sawtimber. This would leave 86 million board feet to be obtained from other ownerships. The present cutover condition of other ownerships indicates they will be unable to supply such quantities for more than a very few years in the future. The solution for local economy appears to be in the use of a greater proportion of the available volume of pole sized materials as wood products other than sawtimber.

Under better management practices, the allowable annual cut may be increased substantially in the distant future, as is indicated under growth potentials in table 5. The realizable growth indicated in this table is close to 100 million board feet annually.

f. Cutting Budget

The cutting budget for the next five years is indicated in appendix table 10, "Coordinated Annual Timber Harvest and Access Road Plan." This cutting plan also lists roads which will be needed in the next five years to carry out the plan. A map showing the cutting areas is found in the appendix. The map shows present and proposed timber sales and roads listed on the five-year plan. The "Coordinated Annual Timber Harvest and Access Road Plan" will hold to the allowable cut and silvicultural objectives stated elsewhere and will be revised annually to keep it current.

7. SALES POLICY

a. Size and Timing of Sales

Size of sales will be determined by silvicultural needs of individual stands, accessibility, and, to a lesser degree, the needs of local operators. The greatest demand is for small sales. Many operators are in need of sales of less than one million board feet. In main drainages where relatively large volumes must be sold to develop an area, sales must be of a size to extend over a period of years. The availability of Federal access road construction money will have a decided bearing on the amount of timber that can be offered for sale at one time. Without Federal aid in road construction, sales will have to be larger than otherwise.

Offerings of timber will be designed and timed to favor industrial needs insofar as possible. With the exception of the Sullivan Lake Block, there is competitive interest for all timber offered for sale.

b. Point of Manufacture

Historically, the small towns and communities built at rail shipping points and adjacent to the forest have been the principal point of manufacture. There is no reason to suppose this will change. Appraisal of timber will consequently be based on utilization at these points. However, some saw logs will be shipped to Spokane and that vicinity for manufacturing. Lumber from the Diamond Match sawmill at Metaline Falls will undoubtedly be shipped to Albeni Falls for finishing and remanufacturing.

Sawmills in and adjacent to the working circle are mainly of the circular type. A few stud mills have come into the area, which tend to provide a market for small sized and mistletoed trees that formerly were not merchantable.

Pulpwood cutting to date has been mainly limited to the needs of the Inland Paper Company of Spokane. The Scott Paper Company of Everett also has shipped pulpwood from this area. Some sawmills have investigated the possibilities of putting in chippers and shipping to the Potlatch pulp plant in Lewiston, Idaho, but only one has been installed to date due to freight rates. There are several pulp and paper companies apparently interested in the Spokane and Sandpoint locations, and it is probable that a pulp plant eventually will be located at one or the other of these points, in which case chipping and sale of pulpwood would be more feasible and more favorable to forest development in this working circle.

c. Merchantability Specifications

Regional merchantability limits and minimum specifications will be observed on all cutting operations and specified in all timber sale contracts.

The long range policy will be to keep abreast of changes in specifications for each species as more complete utilization occurs or appears to be possible. Utilization at stud mills presently goes to a 4-inch top diameter and 8-foot logs. Clear cutting will require utilization to the closest degree possible.

d. Logging Methods

Timber sale contracts will (1) require the control of logging methods to prevent damage to residual stands and the watershed, (2) preserve the productivity of the site, and (3) meet sale requirements under "Coordination With Other Uses." The timber sale agreement or logging plan will specify how trees should be felled to do the least damage and minimize breakage, how to avoid damage of residual trees in skidding, and methods of skidding that will be permitted. Special care will be taken in recreational areas to preserve recreational and aesthetic values.

Sale contracts and logging plans will specify preventive measures that will be taken to prevent soil erosion. This includes maximum grades, type of diversion ditches, outsloping, permanent culverts, etc. A streamside policy will be defined or referred to.

8. FOREST DEVELOPMENT

a. Transportation

The main valleys within and adjacent to the working circle are served by both railways and highways. Roosevelt Lake is also used for transporting logs and lumber. Railroad branch lines run from Newport north along the Pend Oreille River to Metaline Falls and from Spokane through Chewelah and Colville to Kettle Falls. From Kettle Falls, one branch runs northeast along the Columbia River to Canada. Another crosses the Columbia, then follows the Kettle River to Grand Forks, B. C., Curlew, and Republic. Highways follow the rail routes. In addition, state highways go east from Colville to the Pend Oreille River at Tiger and west from Kettle Falls through Republic to the Okanogan Valley. Good county roads approach the forest boundaries in many places.

Transportation within the forest is far from adequate. In much of the area, the problem of developing the road system needed to manage the forest resources is complicated by the fact that past fires have left relatively small blocks of mature timber scattered over much of the area. Where this condition exists, road costs are very high per unit of volume available in the first cut. Generally these scattered patches of mature or overmature timber are badly in need of harvest cutting. Roads constructed to them will serve large areas of young timber now in various age classes below maturity.

(1) Utilization Road Needs

(a) Policy - The present policy is to open up areas of timber in most critical need of harvesting. Amortization of the roads through timber sales will be the ultimate goal, making all the timber stands accessible for removal of the timber products and for other uses that the area requires. This will involve supplementation by forest road funds where timber volumes will not carry the road costs. As a rule there will be one climbing road in each logging unit. All other roads feeding it will be constructed on the contour. Ruling grades on climbing roads will be 7 percent or less, providing all feeder roads can be brought into them on a contour. If this cannot be done, they may have to go to 10 percent or, in a few instances, higher.

(b) Program - Highest priorities will be given to roads which will make accessible those areas where we are most apt to suffer losses due to the overripe and decadent stands. In many areas, the pockets of timber in need of attention are not of sufficient volumes to build a satisfactory road into the area. These areas will have to wait until supplementary funds are available to warrant a suitable road into the area. The principal road needs are shown in table 8 which follows. Complete needs for the next five years are found in the timber harvest-access road plan in the appendix, table 10.

The following are top priority roads:

TABLE 8 - PRINCIPAL ROAD REQUIREMENTS

Road No.	Road Name	Planned Construction Standard	Mileage	Estimated Cost to Complete
353	Scatter Creek	DN-26	7.7	\$190,000
349	Kerry Creek	SN-14	4.0	40,000
315.1	Salmo River	SN-16	9.4	260,000
315.2	Salmo River	SN-14	9.5	250,000
399	Catherine Creek	SN-14	*9.9	*100,000
*592	Roger Road	SN-14	*7.0	60,000
567	Cato-Paupac-Tioga	SH-16	16.5	182,000
645	Leslie	SN-14	5.5	31,500

*As per Transportation Plan 679-R.

b. Planting

(1) Needs - Planting needs may be gauged by reference to stocking tables. Table 2a shows 24,908 acres as nonstocked. It is estimated that not more than a third of this area is plantable without ground preparation. Also, some of it will never produce good timber owing to poor site quality. About 10,000 acres of the total area nonstocked is in the process of restocking naturally or will be restocked artificially within the next 10 years. Improvement of stocking is needed on much additional area, particularly poorly stocked pole and seedling and sapling stands. The total acreage of poorly stocked poles and seedling and sapling stands on medium to good sites is shown in table 2a as 43,231 acres. These areas are outside of the timber sale areas, and many will require preparatory work to make them ready for planting. Appropriated funds will be needed to do this work. Further related work is indicated in the five-year planting plan (appended table and map^{1/}) which shows that 9,884 acres are in need of planting surveys, 6,100 acres need brush eradication, and 200 acres need rodent control. To accomplish this work in a 20-year period will require the planting of 1,250 acres per year.

(2) Policy - Regional policy will be followed in regard to both surveys and planting. A lengthy waiting period for restocking nonstocked and cutover areas should be avoided. A careful analysis of each planting proposal will be made as to need, purpose, priority of site, and species. Planting with the use of appropriated funds will be carefully correlated with K-V planting programs.

(3) Program - The five-year planting plan shown in appendix^{1/} will guide the planting program. In brief, it is as follows:

<u>Year</u>	<u>P&M Acres</u>	<u>K-V Acres</u>
1958	230	60
1959	274	155
1960	270	160
1961	290	140
1962	<u>280</u>	<u>140</u>
TOTAL	1,344	655

This averages only 400 acres per year for the next five years, instead of 1,250. Increased funds are needed, but for the time being plans must be geared to the present level of funds available. Annual revisions of the five-year planting plan will be necessary to keep the plan current.

^{1/} Not reproduced in this copy.

c. Timber Stand Improvement

(1) Need - To meet the objective of producing the maximum volume of wood products from all commercial forest areas, almost all stands are in need of some form of cultural treatment.

Nearly all the well-stocked seedling and sapling size class is in need of weeding or thinning. White pine and ponderosa pine in pole and sapling size classes would also benefit by pruning.

Mistletoe surveys have been conducted in all blocks except Sullivan Lake. These surveys indicate that dwarfmistletoe infestation is quite prevalent in all size and age classes of the larch--Douglas-fir type. It is estimated that 60 percent of this type will need treatment for control of mistletoe.

The following area tabulations indicate the extent of cultural operation needed.

Thinning - All well-stocked stands in pole and sapling and seedling size classes.

<u>Type Acreage</u>						
<u>WP</u>	<u>PP</u>	<u>LPP</u>	<u>L-DF</u>	<u>S-AF</u>	<u>C-H-GF</u>	<u>TOTAL</u>
1,516	916	104,801	128,844	3,308	185	239,570 acres

Pruning - Well- and medium-stocked stands in pole and sapling size classes.

<u>WP</u>	<u>PP</u>	<u>TOTAL</u>
1,687	3,090	4,777 acres

Mistletoe Control - Sixty percent of all larch--Douglas-fir type in all sizes and age classes.

TOTAL: 317,170 acres

K-V funds collected from timber sales will be used to the fullest extent to control mistletoe infestations, but even in sale areas appropriated funds will be needed to supplement K-V funds if a complete job of mistletoe control is to be done. Appropriated funds will be needed for all work outside of sale areas.

(2) Policy - To accomplish the planned T.S.I. objectives, prescriptions stated in F. S. Manual, title 7, chapter 1, par. 102.5-102.7, and those in the Planting and Stand Improvement Handbook will be followed. This will be supplemented by recommendations in the timber marking guides and other superseding information in accordance with regional policy.

(3) Program - The T.S.I. program will follow the sales program until appropriated funds are available to treat other areas. The K-V monies collected in timber sales will be used to improve sale area stands but often will not be sufficient to do the entire project. Eradication of mistletoe will be a primary objective and use for the funds on a great majority of sale areas. On ponderosa pine sites, the program will be directed toward the re-establishment of ponderosa pine by planting. If necessary in lodgepole pine stands, K-V monies will be used for elimination of nonmerchantable lodgepole pine, for seedbed preparation, and for regeneration of the stand to larch and Douglas-fir. Special emphasis should be given to areas where larch and Douglas-fir are already established.

K-V plans will be made for each timber sale area. Appended map V lists the acres covered by K-V in the past and in existing sales.

d. Insect and Disease Control

(1) Problem - Both defoliating insects and bark beetles pose a threat to the forest resources of the working circle. The tussock moth took a heavy toll of timber in the Republic Block and adjacent areas during the early thirties. Again, in 1955, it made considerable headway in second-growth stands outside of the forest boundaries in the Colville area. However, parasites and other conditions caused it to become endemic in 1956.

The Engelmann spruce bark beetle, following on the heels of a blow-down, caused considerable loss of spruce in 1952 and 1953 in the Sullivan Lake Block. It, too, seems to have about run its course, as indicated by recent surveys. Trap trees and logging were used as control measures. It is probable that the beetle will not again become epidemic unless blowdown, fire, or some other factor produces a population buildup.

White pine blister rust has taken a heavy toll of young growth in the eastern portion of the working circle. Two units in the Sullivan Lake Block have been protected since the inception of the present program. Each is on a maintenance basis and will require little additional work unless disturbed. Another unit, Stony Creek, has only recently been brought into the blister rust control program. Practically all of this area is young growth and will require considerable work before it reaches a maintenance basis. The three units are shown on map V, appended.

Dwarfmistletoe has taken a heavy toll in most larch and Douglas-fir stands. All size classes are infected. Table 11 in the appendix shows the results of a study made in 1956 by D. Graham of the Inland Empire Research Center of the Intermountain Forest and Range Experiment Station. His study covers all areas in the working circle except the Sullivan Lake Block.

<u>Dwarfmistletoe in Mature Stands</u>					
<u>Survey</u>	<u>Douglas-fir</u>	<u>Larch</u>	<u>Lodgepole Pine</u>	<u>All Species</u>	
Roadside	76%	86%	25%	77%	
	<u>Douglas-fir</u>		<u>Larch</u>		
	<u>No. Trees</u>	<u>Bd. Ft. Vol.</u>	<u>No. Trees</u>	<u>Bd. Ft. Vol.</u>	
Plot	74%	80%	90%	92%	

<u>Dwarfmistletoe in Immature Stands</u>					
	<u>Douglas-fir</u>			<u>Larch</u>	
	<u>Large Pole</u>	<u>Small Pole</u>	<u>Sapling</u>	<u>Large Pole</u>	<u>Small Pole Sapling</u>
Plot	51%	41%	28%	76%	60% 39%

(2) Policy - It will be the policy to take full advantage of all approved silvicultural measures and practices in harvesting timber crops to aid in the control and elimination of insects and diseases in timber stands. Insofar as possible, monies collected for K-V will be directed to aid in the control and elimination of insects and diseases, which cannot be done by harvesting the merchantable crop.

(3) Programs - As much as possible of the work done for control of insects and diseases will be through K-V collections. It will not be sufficient and must be supplemented in most cases with appropriated funds. The blister rust control program will be carried out largely with appropriated funds. Areas can only be added to the white pine blister rust program when an analysis indicates that it is economically feasible to do so and the units can be properly protected.

Detection surveys will be made to determine the extent of the infestation when there are indications that a disease or insect infestation is building up. A specimen of the insect or disease

and its type of damage will be sent to the entomology or pathology division of the regional office for identification when insect or disease kills are noted in the forest. When epidemic buildup occurs, recommendations of the regional office will be followed, and careful plans laid for taking control measures.

e. Fire Control

(1) Needs

(a) Annual Losses - The fire history in the supplementary data and the map in the appendix shows large areas covered by fires in the past. When drought conditions and high winds create severe burning conditions, some large fires may again be expected to occur. Fire losses during the last 10 years have been minor. Improved transportation facilities, favorable weather conditions, and education of forest users have largely been responsible for the decrease.

The following tabulation of number of fires and burned areas applies to the last ten years (1948-1957 inclusive).

	<u>Man Caused</u>			
	<u>Old Growth</u>	<u>Second Growth</u>	<u>Noncommercial Forest Land</u>	<u>Total</u>
Number	64	18	14	96
Acres Burned	420	100	70	590
	<u>Lightning Caused</u>			
Number	192	8	54	254
Acres Burned	46	4	15	65
	<u>Total All Causes</u>			
Total Number	256	26	68	350
Total Acres Burned	466	104	85	655

(2) Policy - The policy will be to meet regional fire control standards for prevention, presuppression, and suppression. Regional instructions will govern in determining fire control action to be taken. The burn area objective will be to hold the burn within 1,025 acres per year, or .11 percent, which is "par" for the forest.

Timber sale contracts will indicate cooperative action to be taken on the part of timber purchasers, the number of men, type of fire equipment that each operator must have on hand, and the action he must take in the event of fire. Fire plans will be prepared on all active timber sales.

Full cooperation with State fire protection organizations and other Federal agencies will be arranged. State laws relative to slash disposal and fire control will be adhered to in making up fire control and slash disposal plans. Additional protection is provided for areas of high recreational aesthetic values through prevention guard contacts and through intensified aerial detection.

(3) Slash Disposal - Regional standards and approved slash disposal practices will be followed. Application of results from research in slash disposal, in particular those recommended in Strong's report, will be closely followed and used.

Full advantage will be taken of dozer piling, chippers, and other mechanical means of slash disposal to reduce hazard to satisfactory regional standards. Protection instead of disposal will be prescribed in some specific areas.

(4) Silvicultural Use of Fire - Fire will be used as a silvicultural tool in a number of the heavily infected mistletoe stands where block clear cutting will be practiced and where fire is needed to destroy nonmerchantable, mistletoe-infected trees left after merchantable materials are removed. Scarifying before seed years will be used with burning in windrows.

In the Sullivan Lake Block, there is a considerable acreage of hemlock. Where it will be possible to use fire to aid in the regeneration of other species, seedbed preparation of this sort will be done so that other species will establish themselves. Most of these areas have heavy duff, and, with the exception of hemlock, most species have to have mineral soil exposed in order to reseed.

All prescribed spot and broadcast burning of slash will be closely correlated with fire control plans and the availability of suppression forces.

(5) Programs - Annually make out operating plans to reduce slash concentration created by logging operations. In sales contracts, provide for the necessary supplemental protection. There is a need for access roads in all blocks of the working circle to make timber areas accessible and to enable the reduction of lapse time between initial discovery of the fire and time of first attack. This could mean the saving of millions of board feet of timber, important watershed, wildlife, and wildlife habitat. Strict fire prevention measures are now and will continue to be a "must" in managing the timber resources of this working circle. Operators will be required to comply with all existing State fire laws and any additional restraint the Forest Service deems necessary.

f. Acquisition and Exchange

Regional policies in regard to land exchanges will be closely followed. The long-term objective will be to consolidate national-forest lands within national-forest boundaries. Consolidation of ownership would benefit both private owners and the Government in decreased administrative costs.

The Colville Block and portions of the Sullivan Lake Block were obtained from the Resettlement Administration. Some Federal and other lands adjacent to these tracts are not included in the Colville National Forest.

The Northern Pacific Railroad owns some 28 thousand acres within the national-forest boundaries as alternating sections in the southern part of the Colville and Sullivan Lake Blocks. Consolidations here would depend upon the Northern Pacific Railroad and the national-forest regional exchange policy and plans. The Colville Block is split by the Little Pend Oreille Wildlife Refuge. Consolidation of this Federal holding with the national forest would be very desirable. Pend Oreille County also has some land within the national-forest boundary, and the forest has a few isolated tracts outside the boundary proper in the Ione area that would make desirable exchange material.

9. COOPERATION

a. Other Federal Agencies

There will be coordinated planning and action programs with other Federal agencies active in the working circle.

b. State Agencies

Closely coordinated planning with the State Game Department in regard to game problems, such as winter game ranges, and with the State Department of Natural Resources in fire control and the Forest Practices Act will be pursued.

c. Private Agencies

Cooperate with local sportsmen's organizations on all recreational, game, and fish management problems. Acquaint other organizations and other agencies with forest problems and programs.

d. International

Cooperate with Canada as need develops for taking timber out through the States or through Canada. Plan road systems to take as much timber out through the United States as possible, thus avoiding international complications.

10. PLAN OPERATION

- a. Reinventory and revise the plan every ten years to keep the plan workable and alive.
- b. Keep current the five-year cutting and timber access road plan; likewise, the T.S.I. and planting program.
- c. Use plan as a reference guide and tool to timber management planning and preparation of sales.
- d. Post once-a-year depletion records and compare with allowable cut and other plan objectives.
- e. Take advantage of data obtained from study plots, growth studies, experience in control of mistletoe, and other insect and disease control measures that apply to the working circle.

E. SUPPORTING DATA

1. HISTORY

History of the area dates from 1825 when the Hudson Bay Trading Company established a trading post at Kettle Falls. The first white man to descend the Upper Columbia River was David Thompson in July, 1811, in connection with activities of the Northwest Fur Company.

Most of the land west of the Columbia River was set aside in 1872 as the Colville Indian Reservation. The Government, on July 1, 1892, bought back the north half, which includes the Republic, Curlew, and Kettle Falls Blocks. In 1896, it was opened to mineral development and, in 1900, to homesteading.

The Colville National Forest was established March 1, 1907. The Colville Block and that part of the Sullivan Lake Block west of the Pend Oreille River were obtained from the Resettlement Administration in the middle 1930's as additions to the forest.

The lumbering industry has been slow in developing over the main portion of the working circle. There were large sawmills in the Pend Oreille River drainage in the period from 1913-1933, but few elsewhere. The main interest was in white pine. These large mills and those in the Spokane area cut over most of the Northern Pacific Railroad lands within the Colville National Forest. Mills in the Arden District carried on extensive logging operations on private lands, including areas within the wildlife refuge from 1905-1934. The Hedlund sawmill started large-scale operations in the Sherman Creek area prior to the Dollar Mountain fire.

Most of the early sales in the Curlew, Republic, and Orient areas were for railroad ties. It was only at the start of World War II that the sawmills moved into all areas on a large-scale basis.

Fires have made serious inroads on the timber stands in the working circle. Many fires during the 1880's burned over much of the area. In 1910, there were 46 fires that burned over 50,000 acres. In 1920, there were about 100 fires that burned over another 50,000 acres. The largest of these were: Slate Creek, where about 7,000 acres burned; Indian Creek, 7,680 acres burned; Pierre Lake, 6,465 acres burned; Golden Harvest, 5,410 acres burned; and Coco near Swan Lake, about 3,000 acres burned. Another bad year was 1921, when about 29,000 acres were burned. The largest of these were the Flat Creek fire, which burned about 10,000 acres, and the Linderman fire on Little Boulder, which burned 14,000 acres. In 1922, 49 fires covered 8,500 acres. The worst one of the season was the Deer Creek fire, with over 5,000 acres. In 1924 and 1925, about 250 fires burned over approximately 15,000 acres. A very bad year on the eastern half of the working circle was 1926. Much of the area west of the Pend Oreille River was covered by a fire that burned from Ione to the Canadian Border, covering about 40,000 acres. Other fires were the Slate Creek fire of about 15,000 acres; Harvey Creek, about 25,000 acres; and Roger Mountain, 5,000 acres. There were some fires in this year that

moved onto the Colville from surrounding lands managed by other agencies. These burned 80,000 acres on the west side of the working circle. The 17-mile fire crossed from the Indian Reservation, the Elbow Lake fire moved in from the State, and the Sheep Creek fire came in from Canada.

The worst fire season in the history of the Colville National Forest was 1929. Fires burned over 200,000 acres. The largest and most destructive was the Dollar Mountain fire that burned over 142,000 acres of the Kettle Falls Block. The Crowell Ridge and the LeClerc Creek fires burned over 30,000 acres on the Sullivan Lake Block. On the Colville Block, the Dominion fire and the Aladdin fire burned about 20,000 acres. In 1931, the Tiger Hill fire burned over 10,000 acres.

Another destructive fire year was 1934. The Silver Creek fire on the Colville Block burned over 20,000 acres. The Aeneas Creek fire burned 8,000 acres of national-forest land on the Curlew Block and 2,500 acres on the Kettle Falls Block.

Since fire records have been kept, losses have totalled approximately 550,000 acres of commercial forest land.

The losses due to fire have been much less in recent years. Improved transportation facilities, communications, control and prevention methods, favorable weather conditions, and education of forest users have been the factors largely responsible for the decreases. The map in the appendix shows areas covered by fires.

2. PHYSIOGRAPHY

a. Topography

Most of the bottom lands bordering the major drainages are outside the forest and the working circle. Practically all are tillable and farmed. Within the forest, the tributaries to the major drainages have little land suitable for agriculture. Most of the terrain within the forest has from gentle to moderately steep slopes, with some very steep slopes being found in the Sullivan Lake area and portions of the Kettle Range. In the San Poil River drainage and other parts of the working circle, rock outcropping is quite common and makes road construction very costly. The elevations vary from 1,400 feet along the Columbia River to 7,500 feet at Snowy Top Mountain. Merchantable timber usually only goes up to 6,500 feet.

b. Soils

The soils in the lower lands along the Kettle, Columbia, and Pend Oreille Rivers were formed from ancient glacial deposits and from sediment left from lakes which were formed by the receding of glacial ice. Some of the soils are sandy loam and have a tendency to erode when left without cover.

Soils on the Kettle Range and other ranges of mountains above the glacial level were formed in place, originating from basalt rock and other formations. It is a shallow, fertile soil suited mainly to forest crops. There is a third combination which is composed of soils washing down over soils deposited by glaciers.

A soil survey is being made of portions of the forest by Washington State College in cooperation with the Forest Service.

c. Climate

Annual temperature and precipitation from weather recording stations in the area are as follows:

	<u>Republic</u>	<u>Laurier</u>	<u>Chewelah</u>	<u>Metaline Falls</u>
Mean Annual Temp.	38.4	46.2	45.4	46.1
Lowest Annual Precip.	16.12	17.5	18.69	26.4
Highest Temp. 1956	96 on 7/19	104 on 8/14	101 on 8/15	99 on 8/14
Lowest Temp. 1956	-29 on 1/31	-19 on 1/31	-23 on 1/31	-9 on 1/31

There is a decided difference (10 inches plus) in annual precipitation between Republic at the west side of the working circle and Metaline Falls at the east side. This, more than anything else, accounts for the difference in timber types at the respective sites.

Snow depths vary considerably at the lower elevations, where they may reach a maximum of 1 to 1½ feet. At the upper elevations, near the divide on the Kettle Range, 5 to 7 feet is not unusual.

On the west side of the working circle, logging may be done the year around at lower elevations. When breakups occur in the spring and when heavy rains occur in the fall, short shutdowns may be necessary. In the Metaline Falls area, logging usually shuts down about December 1 and does not open up until late April or May. In the higher elevations, it usually begins in June or the first of July.

3. ECONOMY

a. Communities

The population within the working circle is rather small. For year-long occupancy, it does not number more than 285 persons. The largest community adjacent to the working circle is Colville, with a population over 4,000. The other communities, as of June 15, 1958, number:

Chewelah.....1,595	Curlew.....175	Ione.....730
Kettle Falls.. 853	Metaline Falls..629	Northport..494
Republic.....1,015	Metaline.....511	Orient..... 50

All are shipping points. Communities are dependent for the greater part on the timber industries. In most cases, forest industries make up more than 50 percent of the community payrolls, with a much larger percent being tied up indirectly with the wood-product industries. On a county basis, agriculture would lead the wood-working industries in importance from a dependency standpoint.

b. Industries

Industries within the working circle are lumbering, mining, agriculture, stock raising, and recreational services. The first two, with stock raising, dominate and are about of equal importance to the local economy. The lumbering industries are centered mainly around Colville, Kettle Falls, Chewelah, Republic, Curlew, Ione, and Metaline Falls. The mining industries are mainly in Republic, Colville, and Metaline Falls. Stock raising is more important in the Kettle Falls, Republic, and Curlew areas than elsewhere. The farming area is located in the Colville, Kelly Hill, and Pend Oreille areas.

Following is a list of the more important sawmills found in the area, together with their average annual production of lumber:

Name	Location	Annual Cut	Remarks
San Poil Lbr. Co.	Republic	15 MM	Also cuts studs
Columbia Lbr. Co.	Kettle Falls	12 MM	
Diamond Match Co.	Metaline Falls	12 MM	
Avey Bros. Lbr. Co.	Kettle Falls	10 MM	
Fred Draper Lbr. Co.	Colville	10 MM	Also cuts studs
Hill Lbr. Co.	Curlew	10 MM	
Smith-Nielsen Lbr. Co.	Kettle Falls	10 MM	Cuts only studs
Ione Lbr. Co.	Ione	8 MM	
Arden Lbr. Co.	Colville	6 MM	
Cel Chout Lbr. Co.	Colville	6 MM	
Atchison Lbr. Co.	Wauconda	5 MM	Also cuts studs
Brauner Lbr. Co.	Kettle Falls	5 MM	Also cuts studs
Chewelach Lbr. Co.	Chewelach	5 MM	
Chopot Lbr. Co.	Colville	5 MM	
C. R. Day	Colville	5 MM	
Kettle Falls Lbr. Co.	Kettle Falls	5 MM	
L. M. Matney	Kettle Falls	5 MM	
Otto Hill	Northport	5 MM	
Palm Brothers	Northport	5 MM	
Ralph Gilbert	Northport	5 MM	
Roy Hathaway	Republic	5 MM	
Bean Lbr. Co.	Chewelach	4 MM	
Conner's Mill	Colville	4 MM	
Wm. Kleinhans	Curlew	3 MM	Cuts only studs
TOTAL		165 MM	

The following companies from other communities ship logs from this area to their sawmills:

Deer Park Pine Ind.	Deer Park	40 MM
White Pine Sash Co.	Spokane	15 MM
Baird-Naundorf Lbr. Co.	Hillyard	10 MM
Long Lake Lbr. Co.	Spokane	being reconstructed
Pike Lbr. Co.	Spokane	10 MM
Big Bend Timber Co.	Grand Coulee	5 MM

The list does not include the sawmills cutting 2 MM board feet or less per year. Throughout the working circle and adjacent area, small mills will manufacture about 10 MM feet annually. The outlets for timber are through the larger manufacturing plants. It is expected that the Spokane plants may enter more and more into competitive bidding for local timber as their holdings become cut over.

Pulpmills - The Inland Empire Paper Company of Spokane, Washington, is the nearest pulp plant but does not obtain any large volume of pulp material from this area. The Scott Paper Company of Everett, Washington, has been shipping lodgepole pine, white fir, and spruce to the coast for some time. It is not interested in larch and Douglas-fir and other species at the present time.

Not including the logs shipped to Spokane and vicinity, the established sawmill capacity is about 175 MM board feet per year.

Even cutting the total allowable cut of all products, 80 MM sawtimber and 108 M cords of other products, the forest is unable to supply the needs of installed sawmill capacity in the area. Private timberlands are becoming depleted of sawtimber size material, and more mills will probably have to become more interested in manufacturing the second growth timber on private and public lands.

c. Actual Cut - National forest

VOLUME CUT ON NATIONAL-FOREST LANDS (ALL PRODUCTS)
FIVE-YEAR PERIOD, 1953-1957

Year	Block					Total
	Colville	Kettle Falls	Curlew	Republic	Sullivan Lake	
	MM board feet					
1953	2.0	9.6	4.1	5.5	15.1	36.3
1954	5.5	12.5	12.3	8.4	15.0	53.7
1955	3.4	13.3	3.0	8.7	4.7	33.1
1956	4.2	11.8	3.5	4.0	15.5	39.0
1957	10.1	21.0	6.7	5.0	8.1	50.9
Average	5.0	13.6	6.0	6.3	11.7	42.6

APPENDIX

COLVILLE WORKING CIRCLE

TIMBER MANAGEMENT PLAN

TABLE 1 - AREAS OF COMMERCIAL FOREST LAND (NONRESERVED)
BY BLOCKS, TIMBER TYPES AND STRATA - NATIONAL FOREST

Strata	Colville	Kettle Falls	Curlew	Republic	Sullivan Lake	Total
Area in Acres						
W9W	-	-	-	-	1,288	1,288
W9M	-	-	-	-	3,491	3,491
W9P	-	-	-	-	1,293	1,293
W8W	-	-	-	-	574	574
W8M	-	-	-	-	55	55
W8P	-	-	-	-	62	62
W7W	-	-	-	-	942	942
W7M	-	-	-	-	116	116
W7P	-	-	-	-	178	178
P9W	580	5,429	-	2,796	78	8,883
P9M	7,347	12,671	1,675	10,271	1,688	33,652
P9P	13,005	10,696	3,913	3,389	1,995	32,998
P8W	82	50	-	-	120	252
P8M	103	-	-	-	32	135
P8P	11	20	-	-	4	35
P7W	21	-	-	-	643	664
P7M	-	953	-	-	1,086	2,039
P7P	452	3,693	-	-	57	4,202
LD9W	40,594	26,460	23,652	14,859	6,132	111,697
LD9M	25,876	47,483	26,496	31,141	23,579	154,575
LD9P	13,488	16,351	7,497	9,790	20,674	67,800
LD8W	4,839	12,037	2,259	2,391	21,077	42,603
LD8M	2,014	7,580	755	2,131	7,779	20,259
LD8P	1,110	2,030	-	157	3,588	6,885
LD7W	31,729	16,791	1,988	3,696	32,037	86,241
LD7M	1,044	6,453	710	1,306	14,136	23,649
LD7P	1,332	2,925	155	174	10,323	14,909
SAF9W	304	1,536	648	300	7,911	10,699
SAF9M	-	595	300	215	8,549	9,659
SAF9P	20	55	80	160	2,554	2,869
SAF8W	-	-	-	230	1,508	1,738
SAF8M	-	-	-	40	1,490	1,530
SAF8P	-	-	-	-	1,130	1,130
SAF7W	-	30	-	-	1,540	1,570
SAF7M	-	-	-	-	1,832	1,832
SAF7P	-	-	-	-	4,477	4,477
CHGF9W	72	165	-	-	5,640	5,877
CHGF9M	83	625	-	-	5,923	6,631
CHGF9P	-	110	-	-	1,148	1,258
CHGF8W	-	-	80	-	-	80
CHGF7W	-	-	-	-	105	105
CHGF7P	-	-	-	-	6	6

(Continued next page)

TABLE 1, continued - AREAS OF COMMERCIAL FOREST LAND (NONRESERVED)
BY BLOCKS, TIMBER TYPES AND STRATA - NATIONAL FOREST

Strata	Colville	Kettle Falls	Curlew	Republic	Sullivan Lake	Total
	Area in Acres					
LP8W	6,160	21,569	-	3,043	3,294	34,066
LP8M	978	473	-	40	2,329	3,820
LP8P	622	182	-	-	1,736	2,540
LP7W	9,426	44,973	4,240	5,117	6,979	70,735
LP7M	141	6,632	358	659	1,819	9,609
LP7P	720	1,701	4,463	399	1,524	8,807
Hdw.	-	-	-	-	87	87
6	4,889	4,889	2,244	4,889	7,997	24,908
Total	167,042	255,157	81,513	97,193	222,605	823,510
	20%	31%	10%	12%	27%	

**TABLE 2 - VOLUME OF LIVE SAWTIMBER (NONRESERVED) LAND
BY SPECIES, STAND SIZE CLASS, AND OWNERSHIP**

Stand Size		Ownership						
Class	Species	Nat. For.	SmlPriv.	State	LgePriv.	Other Fed.	Total	
Sawtimber:		Merchantable Acres						
		452,757	50,095	15,721	11,405	721	530,699	
		M bd. ft. (Scribner C)						
	W. Pine	162,583	9,193	2,954	14,140	51	188,921	
	P. Pine	568,771	62,732	16,669	6,948	182	655,302	
	Lp. Pine	86,176	13,222	3,903	4,384	288	107,973	
	W. Larch	1,152,739	104,864	39,603	22,475	1,062	1,320,743	
	D.-fir	1,515,373	117,338	50,158	21,240	1,136	1,705,245	
	G. Fir	82,996	6,483	2,286	4,784	-	96,549	
	A. Fir	59,904	3,473	802	8,698	25	72,902	
	Cedar	80,842	6,635	1,621	3,903	155	93,156	
	Hemlock	151,231	14,620	2,557	15,313	96	183,817	
	Spruce	381,183	10,541	6,775	23,753	4	422,256	
	Hdwood	1,058	95	102	16	1	1,272	
	TOTAL	4,242,856	349,196	127,430	125,654	3,000	4,848,136	
Poles:		Merchantable Acres						
		115,844	10,852	4,013	3,914	572	135,195	
		M bd. ft. (Scribner C)						
	W. Pine	1,460	47	46	141	-	1,694	
	P. Pine	6,790	1,220	291	376	66	8,743	
	Lp. Pine	38,225	3,442	1,237	1,180	178	44,262	
	W. Larch	60,350	8,400	2,636	1,935	532	73,853	
	D.-fir	51,218	5,576	1,932	1,775	334	60,835	
	G. Fir	5,503	-	-	144	-	5,647	
	A. Fir	-	-	-	-	-	-	
	Cedar	489	-	-	-	-	489	
	Hemlock	157	-	-	11	-	168	
	Spruce	14,323	-	-	4	-	14,327	
	Hdwood	-	-	-	-	-	-	
	TOTAL	178,515	18,685	6,142	5,566	1,110	210,018	
Total Sawtimber & Poles:		Merchantable Acres						
Percent		568,601	60,947	19,734	15,319	1,293	665,894	
N.F.	All	M bd. ft. (Scribner C)						
3.7	3.8	W. Pine	164,043	9,240	3,000	14,281	51	190,615
13.0	13.1	P. Pine	575,561	63,952	16,960	7,324	248	664,045
2.8	3.0	Lp. Pine	124,401	16,664	5,140	5,564	466	152,235
27.4	27.6	W. Larch	1,213,089	113,264	42,239	24,410	1,594	1,394,596
35.4	34.9	D.-fir	1,566,591	122,914	52,090	23,015	1,470	1,766,080
2.0	2.0	G. Fir	88,499	6,483	2,286	4,928	-	102,196
1.4	1.4	A. Fir	59,904	3,473	802	8,698	25	72,902
1.8	1.9	Cedar	81,331	6,635	1,621	3,903	155	93,645
3.4	3.6	Hemlock	151,388	14,620	2,557	15,324	96	183,985
8.9	8.6	Spruce	395,506	10,541	6,775	23,757	4	436,583
.2	.1	Hdwood	1,058	95	102	16	1	1,272
		TOTAL	4,421,371	367,881	133,572	131,220	4,110	5,058,154

TABLE 3 - MERCHANTABLE AREAS AND VOLUMES BY SPECIES, TYPE, AND STRATA - NATIONAL FOREST

Strata	Acres	WP	PP	WL	IF	GF	H	C	S	LPP	Hdw	Total
W9W	1,288	14,319	66	972	2,522	8,722	1,810	873	657	79		30,020
W9M	3,491	32,707	-	2,297	3,561	9,164	3,233	1,407	3,508	84		55,961
W9P	1,293	5,750	19	943	936	46	900	-	983	419		9,996
P9W	8,883	127	97,859	2,466	17,055	-	-	-	-	213		117,720
P9M	33,652	-	187,744	5,618	51,623	-	-	-	-	551		245,536
P9P	32,998	-	113,287	3,678	33,733	-	-	-	-	-		150,698
LD9W	111,697	35,045	55,277	610,676	495,652	54,269	10,981	23,524	143,886	51,302		1,480,612
LD9M	154,575	-	102,387	415,548	706,147	-	25,766	9,841	27,535	16,389	445	1,304,058
LD9P	67,800	2,972	12,132	99,711	141,473	1,434	2,563	7,823	-	15,237		283,345
S-AF9W	10,699	25,598	-	6,216	25,882	14,871	1,447	1,658	111,668	546		187,886
S-AF9M	9,659	17,440	-	2,071	14,243	13,649	1,691	45	46,583	909		96,631
S-AF9P	2,869	2,625	-	301	2,926	4,066	371	11	7,316	270		17,886
C-H-GF9W	5,877	19,284	-	1,253	6,909	8,356	54,606	27,449	25,403	-		143,260
C-H-GF9M	6,631	6,277	-	473	12,048	25,908	45,165	7,741	12,892	59		110,563
C-H-GF9P	1,258	439	-	516	641	2,415	2,698	470	752	118	613	8,049
Hdw.	87	-	-	-	22	-	-	-	-	-		635
Total	452,757	162,533	568,771	1,152,739	1,515,373	142,900	151,231	80,842	381,183	86,176	1,058	4,242,856
W8W	574	895	-	181	1,192	1,959	154	392	59	111		4,943
W8M	55	98	-	19	36	10	3	5	-	-		171
W8P	62	14	-	13	3	8	-	2	7	-		47
P8W	252	44	309	38	103	-	-	-	-	12		506
P8M	135	119	119	6	74	-	-	-	-	-		199
P8P	35	-	12	-	3	-	-	-	-	-		16
LD8W	42,603	-	5,880	43,455	21,727	-	-	-	-	14,230		85,292
LD8M	20,259	-	-	9,927	20,666	-	-	-	-	4,091		34,684
LD8P	6,885	409	177	2,878	6,808	-	-	-	-	551		10,823
S-AF8M	4,398	-	-	-	-	3,197	-	-	13,497	551		17,245
C-H-GF8M	80	-	-	84	156	329	-	90	760	-		1,419
LP8W	34,066	-	293	3,422	-	-	-	-	-	15,492		19,207
LP8M	3,820	-	-	195	210	-	-	-	-	2,988		3,393
LP8P	2,540	-	-	132	240	-	-	-	-	198		570
Total	115,764	1,460	6,790	60,350	51,218	5,503	157	489	14,323	38,225		178,515
GRAND	568,521	164,043	575,561	1,213,089	1,566,591	148,403	151,388	81,331	395,506	124,401	1,058	4,421,371

TABLE 4 - CUBIC VOLUME BY OWNERSHIP OF TIMBER UNDER 11" d. b. h.

	Acres	WP	PP	LP	L-DF	S-AF	C-GF-H	Hdw	Total
Sawtimber				M Cubic Feet					
N.F.	452,757	3,054	10,877	-	193,071	55,284	6,846	26	269,158
Sml Priv.	50,095	185	1,176	-	20,218	1,098	423		23,100
State	15,721	30	302	-	7,181	765	48	4	8,330
Lge Priv.	11,405	272	136	-	4,661	5,481	627		11,177
Other US	721	-	-	-	234	-	-		234
Total	530,699	3,541	12,491	-	225,365	62,628	7,944	30	311,999
Poles									
N.F.	115,764	455	496	75,997	83,534	2,750	25		163,257
Sml Priv.	10,852	-	225	3,242	11,492	-	-		14,959
State	4,013	-	-	1,661	3,477	-	-		5,138
Lge Priv.	3,914	30	239	3,308	1,839	-	-		5,416
Other US	572	-	-	-	786	-	-		786
Total	135,115	485	960	84,208	101,128	2,750	25		189,556
Total									
N.F.	568,521	3,509	11,373	75,997	276,605	58,034	6,871	26	432,415
Sml Priv.	60,947	185	1,401	3,242	31,710	1,098	423		38,059
State	19,734	30	302	1,661	10,658	765	48	4	13,468
Lge Priv.	15,319	302	375	3,308	6,500	5,481	627		16,593
Other US	1,293	-	-	-	1,020	-	-		1,020
Total	665,814	4,026	13,451	84,208	326,493	65,378	7,969	30	501,555

TABLE 4a - CUBIC VOLUME BY OWNERSHIP OF TIMBER OVER 11" d. b. h.

	Acres	WP	PP	LP	L-DF	S-AF	C-GF-H	Hdw	Total
Sawtimber				M Cubic Feet					
N.F.	452,757	18,934	101,080	-	603,346	61,408	53,654	135	838,557
Sml Priv.	50,095	664	11,235	-	52,755	955	3,414		69,023
State	15,721	132	2,515	-	21,143	925	489	19	25,223
Lge Priv.	11,405	1,622	701	-	10,129	6,666	6,288		25,406
Other US	721	-	-	-	595	-	-		595
Total	530,699	21,352	115,531	-	667,968	69,954	63,845	154	958,804
Poles									
N.F.	115,764	1,017	175	5,010	27,550	3,833	293		37,878
Sml Priv.	10,852	-	78	305	3,356	-	-		3,739
State	4,013	-	-	162	1,062	-	-		1,224
Lge Priv.	3,914	71	73	283	702	-	-		1,129
Other US	572	-	-	-	220	-	-		220
Total	135,115	1,088	326	5,760	32,890	3,833	293		48,023
Total									
N.F.	568,521	19,951	101,255	5,010	630,896	65,241	53,947	135	876,435
Sml Priv.	60,947	664	11,313	305	56,111	955	3,414		72,762
State	19,734	132	2,515	162	22,205	925	489	19	26,447
Lge Priv.	15,319	1,693	774	283	10,831	6,666	6,288		26,535
Other US	1,293	-	-	-	815	-	-		815
Total	665,814	22,440	115,857	5,760	720,858	73,787	64,138	154	1,002,994

TABLE 4b - TOTAL CUBIC VOLUME OF PRIMARY GROWING STOCK

	Acres	WP	PP	LP	L-DF	S-AF	C-GF-H	Hdw	Total
<u>Sawtimber</u>			M Cubic Feet						
N.F.	452,757	21,988	111,957	-	796,417	116,692	60,500	161	1,107,715
Sml. Priv.	50,095	849	12,411	-	72,973	2,053	3,837		92,123
State	15,721	162	2,817	-	28,324	1,690	537	23	33,553
Lge Priv.	11,405	1,894	837	-	14,790	12,147	6,915		36,583
Other US	721	-	-	-	829	-	-		829
Total	530,699	24,893	128,022	-	913,333	132,582	71,789	184	1,270,803
<u>Poles</u>									
N.F.	115,764	1,472	671	81,007	111,084	6,583	318		201,135
Sml. Priv.	10,852	-	303	3,547	14,848	-	-		18,698
State	4,013	-	-	1,823	4,539	-	-		6,362
Lge Priv.	3,914	101	312	3,591	2,541	-	-		6,545
Other US	572	-	-	-	1,006	-	-		1,006
Total	135,115	1,573	1,286	89,968	134,018	6,583	318		233,746
<u>Total</u>									
N.F.	568,021	23,460	112,628	81,007	907,501	123,275	60,818	161	1,308,850
Sml. Priv.	60,947	849	12,714	3,547	87,821	2,053	3,837		110,821
State	19,734	162	2,817	1,823	32,863	1,690	537	23	39,915
Lge Priv.	15,319	1,995	1,149	3,591	17,331	12,147	6,915		43,128
Other US	1,293	-	-	-	1,835	-	-		1,835
Total	665,814	26,466	129,308	89,968	1,047,351	139,165	72,107	184	1,504,549

TABLE 5 - COMPUTATIONS OF ALLOWABLE ANNUAL CUT FROM HARVEST CUTTING AREAS
- NATIONAL FOREST -

Kemp Formula

$$AC = \frac{(7A_m + 5A_p + 3A_s + A_n)}{4R} V_m$$

AC = Allowable annual cut

A_m = Area of sawtimber stands

A_p = Area of pole stands

A_s = Area of seedling & sapling stands

A_n = Area nonstocked or restocking*

4 = Number of stand-size classes

R = Rotation in years

V_m = Average volume per acre of sawtimber stands (A_m stratum)

<u>Types</u>		<u>M Bd. Ft.</u>
W. Pine (120)	AC = $\frac{(7 \times 6072 + 5 \times 691 + 3 \times 1236 + 0)}{4 \times 120}$ 15,806	= 1,628
P. Pine (140)	AC = $\frac{(7 \times 75,533 + 5 \times 422 + 3 \times 6905 + 3,000)}{4 \times 140}$ 6,804	= 6,736
L-DF (140)	AC = $\frac{(7 \times 334072 + 5 \times 69747 + 3 \times 124799 + 5592)}{4 \times 140}$ 9,184	= 50,301
C-H-GF (120)	AC = $\frac{(7 \times 13766 + 5 \times 80 + 3 \times 111 + 0)}{4 \times 120}$ 19,023	= 3,842
S-AF (130)	AC = $\frac{(7 \times 23227 + 5 \times 4398 + 3 \times 7879 + 408)}{4 \times 130}$ 13,019	= 5,221
LP Pine (100)	AC = $\frac{(0 + 5 \times 40426 + 3 \times 89151 + 1000)}{3 \times 100}$ 573	= 898
Total		68,626

* Total of 10,000 acres restocking, or will be restocked by planting within next 10 years, out of total of 24908 acres in the nonstocked category.

TABLE 5a - ALLOWABLE CUT OF POLE-SIZE MATERIAL FROM HARVEST CUTTING AREAS
(AFTER KEMP FORMULA)

<u>Types</u>		<u>Area*</u> <u>Factor</u>	<u>Ave. Acre Vol.</u> <u>M Cu. Ft.</u>	<u>Total</u> <u>M Cu. Ft.</u>	<u>Total</u> <u>Cords**</u>	<u>Annual</u> <u>Cutting</u> <u>Area (Acres)</u>
W. Pine	AC =	$\frac{49667}{480}$ x	.503	52	578	103
P. Pine	AC =	$\frac{554556}{560}$ x	.144	142	1,578	990
L-DF	AC =	$\frac{3067228}{560}$ x	.578	3,166	35,178	5,477
C-H-GF	AC =	$\frac{97095}{480}$ x	.497	100	1,115	202
SP-AF	AC =	$\frac{208624}{520}$ x	2.380	954	10,600	401
LP Pine	AC =	$\frac{470583}{300}$ x	1.880	2,948	32,756	1,568
		TOTAL		<u>7,362</u>	<u>81,805</u>	<u>8,741</u>

* Taken from preceding page representing the first term of Kemp formula, or annual cutting area.

** Converting factor - 90 cubic feet per cord.

TABLE 5b - COMPUTATIONS OF ALLOWABLE ANNUAL CUT (HARVEST CUTTINGS)
(AFTER AUSTRIAN FORMULA)
- NATIONAL FOREST -

Austrian Formula

$$AC = I + \frac{Ga - Gr}{R}$$

AC = Allowable annual cut

I = Periodic annual increment*

Ga = Volume of actual growing stock

Gr = Volume of realizable growing stock

R = Rotational age (average for all types)

Sawtimber

$$AC = 60.3 + \frac{4421 - 3352}{138.84}$$

$$= 60.3 + 7.7$$

$$= 68.0 \text{ MM bd. ft.**}$$

* Taken from P.A.I. Table 6 (Appendix)

** Results the same as for each type individually.

TABLE 5c - COMPUTATIONS OF ALLOWABLE ANNUAL CUT (HARVEST CUTTINGS)
(AFTER HANZLIK FORMULA)
- NATIONAL FOREST -

Hanzlik Formula

$$AC = \frac{V}{R} + I$$

AC = Allowable annual cut

V = Volume of timber over rotation age

R = Rotation age

I = Increment of immature stands at rotation age

Type

White Pine

MM Bd. Ft.

$$AC = \frac{46.78}{120} \text{ MM} + 1.694 \text{ MM} = 2.083$$

Ponderosa Pine

$$AC = \frac{267.72}{140} + 4.024 = 5.937$$

Larch--Douglas-fir

$$AC = \frac{817.32}{140} + 45.655 = 51.491$$

Cedar-Hemlock-Grand Fir

$$AC = \frac{130.93}{120} + 1.520 = 2.611$$

Spruce-Alpine Fir

$$AC = \frac{181.44}{130} + 1.947 = 3.343$$

Lodgepole Pine

$$AC = \frac{12.585}{100} + 1.200 = 1.126$$

Total	66.791
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TABLE 5d - COMPUTATIONS OF ALLOWABLE ANNUAL CUT (HARVEST CUTTINGS)
(AFTER VON MANTEL FORMULA)
- NATIONAL FOREST -

Von Mantel Formula

$$Va = \frac{2 \text{ Ga}}{R}$$

Modified Von Mantel

$$Va = \frac{2 \text{ Ga}}{R-a}$$

Va = Allowable annual cut

Ga = Volume of actual growing stock

R = Rotation age (average for all types)*

N = Age when cubic volumes begin to develop

ALL TYPES

Sawtimber

Other Products

Von Mantel

$$Va = \frac{2 \times 4421}{138.84}$$

= 63.7 MM bd. ft.

$$Va = \frac{2 \times 4324}{138.84}$$

= 6,228 M cu. ft.
or
69,200 Cords

Modified Von Mantel

$$Va = \frac{2 \times 4421}{138.84 - 30}$$

= 81.2 MM bd. ft.

$$Va = \frac{2 \times 4324}{138.84 - 30}$$

= 7,927 M cu.ft.
or
88,080 Cords

* Results the same as for each type individually.

APPENDIX TABLE 5e - CALCULATION OF ALLOWABLE ANNUAL CUT AVAILABLE FROM INTERMEDIATE CUTTINGS

- National Forest Lands -

- Areas That May Be Cut Annually -				
Well-stocked Strata	Commercial Forest Area	Portion Under Rotation Age	Area Sub. to Int. Cuttings	Area to Cut Annually*
	Acres	Percent	Acres	Acres
<u>Sawtimber</u>				
W-S-H 9W	17,864	51	9,130	456
P 9W	8,883	48	4,265	213
L-DF 9W	111,697	27	30,175	1,509
<u>Pole</u>				
W-S-H 8W	2,392	100	2,392	120
P 8W	252	100	252	12
L-DF 8W	42,603	100	42,603	2,130
LP 8W	34,066	82	27,900	1,400
Total	217,757		116,717	5,840

- Volumes Available Per Acre From Cutting Areas -								
Strata	Avail. Vol./A		Recommended First Cut Percent	Vol. per Acre of Recommended Cut				
	Sawtbr. M b. f.	Other Cu.Ft.		Sawtbr. M b. f.	Other Products** Cu.Ft.	Cords	M b. f.	Total M b. f.
<u>Sawtimber</u>								
W-S-H 9W	20.6	1,850	25	5.15	463	5.14	1.71	6.86
P 9W	13.2	585	30	4.40	175	1.95	.65	5.05
L-DF 9W	13.3	1,072	30	4.43	322	3.58	1.20	5.63
<u>Pole</u>								
W-S-H 8W	8.6	715	25	2.15	179	1.99	.66	2.81
P 8W	2.5	1,726	30	.75	522	5.80	1.92	2.67
L-DF 8W	2.0	1,523	30	.60	461	5.13	1.71	2.31
LP 8W	.8	2,124	25	.20	531	5.89	1.96	2.16

*Maximum rate--once every 20 years for sawtimber stands, every 20 years for pole stands.

**Conversion to board feet contents at rate of 3 cords per M board feet.

- Indicated Annual Cut From Intermediate Cuttings -					
Strata	Area to Cut Annually Acres	Sawtimber M bd. ft.	Other Products		Total M bd. ft.
			Cords	M bd. ft.*	
<u>Sawtimber</u>					
W-S-H 9W	456	2,340	2,340	780	3,120
P 9W	213	940	410	140	1,080
L-DF 9W	1,509	6,680	5,400	1,800	8,480
<u>Pole</u>					
W-S-H 8W	120	260	240	80	340
P 8W	12	10	70	20	30
L-DF 8W	2,130	1,270	10,870	3,620	4,890
LP 8W	1,400	280	8,250	2,750	3,030
Total	5,840	11,780	27,580	9,190	20,970

*Converted on the basis of 3 cords per M

**TABLE 6 - PERIODIC ANNUAL GROWTH OF SAWTIMBER BY TYPE, SIZE
SITE AND STOCKING - NATIONAL FOREST**

Forest Type	Site Class	Stand-size Class	Stock-ing Class	Com'l Forest Growing Area Acres	Sawtimber Periodic Annual Growth		C&B %	Net P.A.G. Total M bd. ft.
					Per Acre*	Total		
					bd. ft.	M bd. ft.		
WP	II-III	Saw-timber	W	927	485	450	7	418
			M	2,501	438	1,095		1,019
			P	931	351	327		304
WP	"	Pole	W	574	82	47		44
			M	55	60	3		3
			P	62	27	2		2
Subtotal						1,924		1,790
PP	IV	Saw-timber	W	5,150	268	1,380	5	1,300
			M	19,630	222	4,358		4,140
			P	19,230	166	3,192		3,030
PP	"	Pole	W	252	95	24		22
			M	135	83	11		10
			P	35	62	2		2
Subtotal						8,967		8,504
Larch	III-IV	Saw-timber	W	59,400	217	12,890	7	11,980
			M	53,550	177	9,478		8,810
			P	27,450	106	2,910		2,705
Larch	"	Pole	W	21,045	57	1,200		1,115
			M	9,834	31	305		282
			P	3,862	16	62		58
Subtotal						26,845		24,950
DF	III-IV	Saw-timber	W	28,550	217	6,195	7	5,750
			M	66,500	177	11,771		10,930
			P	25,520	106	2,705		2,508
DF	"	Pole	W	21,558	57	1,229		1,140
			M	10,425	31	323		300
			P	3,023	16	48		45
Subtotal						20,671		20,673
C-II-GF	III	Saw-timber	W	2,940	365	1,073	10	966
			M	3,315	328	1,087		977
			P	629	262	165		149
C-H-GF	"	Pole	W	80	20	1		1
			M	-	-	-		-
			P	-	-	-		-
Subtotal						2,326		2,093
S-AF	III-IV	Saw-timber	W	2,580	253	653	5	620
			M	2,410	225	542		515
			P	720	181	130		123
S-AF	"	Pole	W	1,738	20	35		33
			M	1,530	15	23		22
			P	1,130	10	11		10
Subtotal						1,394		1,323
LPP	III	Pole	W,M,P	40,409	-	1,050	5	1,000
TOTAL						63,177		60,333

*Derived from yield tables which reflect area age and mortality.

TABLE 6a - PERIODIC ANNUAL GROWTH IN CUBIC FEET OF ALL PRODUCTS
BY TYPE, SITE CLASS & STAND-SIZE CLASS

- National Forest -

Forest Type and Site Class	Stand- size Class	Com'l For. Growing Area Acres	Normal PAG Per A. cu. ft.	Reduction Factor	Periodic Annual Growth		
					Gross Total M cu.ft.	C&B %	Net Total M cu. ft.
WP	Saw.	4,359	70	.99	302	95	281
	Pole	691	70	.75	36	97.5	35
II-III	S&S	1,236	70	.45	39	-	39
Subtotal		6,286			377		355
PP	Saw.	44,010	38	.99	1,654	93	1,538
	Pole	422	38	.75	13	98	13
IV	S&S	6,905	38	.45	104	-	104
Subtotal		51,337			1,771		1,655
Larch	Saw.	140,400	50	.99	6,950	96	6,675
	Pole	34,741	50	.75	1,303	97	1,267
III-IV	S&S	116,575	50	.45	2,623	-	2,623
Subtotal		291,716			10,876		10,565
DF	Saw.	120,570	45	.99	5,365	95	5,100
	Pole	35,006	45	.75	1,183	94	1,103
III-IV	S&S	8,281	45	.45	167	-	167
Subtotal		163,857			6,715		6,370
H-GF-Ced.	Saw.	6,884	60	.99	410	90	369
	Pole	80	60	.75	4	95	4
III	S&S	111	60	.45	2	-	2
Subtotal		7,075			416		375
Sp.-AF	Saw.	5,710	55	.99	311	95	296
	Pole	4,398	55	.75	182	97	175
III-IV	S&S	6,879	55	.45	170	-	170
Subtotal		16,487			663		641
LP	Pole	40,409	27	.75	816	93	759
	S&S	89,151	27	.45	1,079	-	1,079
Subtotal		129,560			1,895		1,838
TOTAL		666,818			22,713		21,799

TABLE 6b - NORMAL GROWTH AND REALIZABLE GROWING STOCK BY TYPES AND SIZE CLASSES

- National Forest -

Forest Type	Commercial Forest Area Acres	Sawtimber Volumes				Rotation Years	All Product Volumes			
		Normal		Realizable			Normal		Realizable	
		MAI per Acre	Total	MAI x R x .70	MAI x R x .70		MAI per Acre	Total	MAI x R x .70	MAI x R x .70
		bd. ft.	M bd. ft.	M bd. ft.	M bd. ft.		cu. ft.	M cu. ft.	M cu. ft.	M cu. ft.
WP	7,999	492	3,935	82,635	120	100	800	22,400		
PP	90,860	181	16,446	402,926	140	39	3,544	115,782		
L-DF	528,640	193	102,526	2,511,936	140	53	28,017	915,315		
H-GF	13,957	412	5,750	120,750	120	90	1,256	35,168		
S-AF	34,504	277	9,558	234,171	130	80	2,760	90,169		
LPP	134,560	.51 Cd.			100	27	3,633	84,501		
TOTALS	810,520		138,215	3,352,418			40,010	1,263,335		

Colville N. F.
Colville Dist.
Sullivan Lake Dist.

TABLE 7 - AVERAGE STAND PER ACRE IN SAWTIMBER TREES (11" DBH AND OVER)
BY TYPES AND STAND-SIZE CLASSES
- National Forest -

Type Strata	Species											
	WP	PP	WL	DF	GF	WF	Cedar	Hem.	E. Spr.	LP	Hdw.	Total
W9W	11,118	51	755	1,958	6,630	141	678	1,405	510	61		23,307
W9M	9,360		658	1,020	2,550	75	403	926	1,005	24		16,030
W9P	4,447	15	729	724	36			696	760	324		7,731
W8W	1,560		316	2,077	3,412		683	268	102	193		8,611
W8M	1,775		337	652	189		92	61				3,106
W8P	229		209	41	133		41		107			760
P9W	194	8,471	561	418						324		9,968
P9M		4,105	66	1,545						61		5,777
P9P		2,657	184	1,025								3,866
P8W	214	1,530	189	510						61		2,504
P8M		882	46	546								1,474
P8P		806		153						70		1,029
LD9W	750	1,183	5,177	2,091	729		71	235	158	1,034		11,428
LD9M		423	2,570	1,963			199	521	36	240	9	5,961
LD9P	87	235	1,362	1,591		42	299	75		446		4,067
LD8W		138	1,020	510						334		2,002
LD8M			490	1,020						202		1,712
LD8P	87		418	989						80		1,574
S-AF9W	3,116		296	2,688		1,377		141	12,051	38		19,707
S-AF9M	2,040		102	1,530		1,410		188	5,100	94		10,464
S-AF9P	1,020			1,020		1,410		141	2,550	94		6,235
C-GF-H9W	3,376		189	1,153		1,344	4,672	9,560	4,274			24,568
C-GF-H9M	1,045			1,953	495	3,619	1,122	7,520	1,989			17,743
C-GF-H9P	382		377	510	510	1,410	255	2,350	510	94		6,398
LP8W		31	362							441		834
LP8M			51							832		883
LP8P			56	102						66		224
Hdw9W				255							9,400	9,655
Hdw9M				255							7,050	7,305

Colville N. F.
Curlew R.D.
Republic R.D.
Kettle Falls R.D.

TABLE 7a - AVERAGE STAND PER ACRE IN SAWTIMBER TREES (11" DBH AND OVER)
BY TYPES AND STAND-SIZE CLASSES 1/

- National Forest -

Type Strata	Species						Total
	Ponderosa Pine	Western Larch	Douglas-fir (M Board Feet Scribner C)	Grand Fir	Cedar	Spruce	
P9W	11,220	255	2,040				13,515
P9M	6,120	204	1,530				7,854
P9P	4,080	51	1,020				5,151
L-DF9W		5,676	6,125	311	311	2,101	14,570
L-DF9M	775	2,744	5,794			245	9,601
L-DF9P	122	1,581	2,590				4,293
Lp8W						460	460
Lp8M		51	408			460	919
Lp8P						230	230

1/ For volumes not listed in above strata, use Colville and Sullivan Lake average volumes.

Colville N. F.
Colville District
Sullivan Lake District

TABLE 8, continued - AVERAGE STAND PER ACRE IN POLE AND SAWTIMBER STANDS
BY TYPES AND STAND-SIZE CLASSES
- National Forest -

Type Strata	Species													Total
	WP	PP	WL	DF	GF	AF	Cedar	Hem.	E. Spruce	LPP	Hdw.	Pole	Sawt.	
W9W-Sawt. Poles	2,180	10	148	384	1,300	30	132	299	100	13		595	4,596	5,191
	165		26	43	110	20	45	143		43				
	1,837		129	200	500	16	79	197	197	5			3,160	3,503
W9M-Sawt. Poles	34			66	80	11	20	41	78	13		343	1,533	
	872	3	143	142	7			148	149	69		844		2,377
W9P-Sawt. Poles	52		46	27	200		100	182	237					
	38	1,661	110	82						69			1,960	2,545
		534		19						32		585	1,134	1,450
P9M-Sawt. Poles		805	13	303						13		316	758	
		154	3							159		4		762
P9P-Sawt. Poles		521	36	201										
		4												
L-DF9W Sawt. Poles	147	232	1,015	410	143		14	50	31	220		1,072	2,262	3,334
	100		206	364			45			357				
L-DF9M Sawt. Poles		83	504	385			39	111	7	51	2	569	1,182	1,751
	54		99	93	158			22	5	138				
L-DF9P Sawt. Poles	17	46	267	312			45	16	13	95	25	299	807	1,106
	12	119	96	34		9								
S-AF9W Sawt. Poles	611		58	527		293		30	2,363	8		2,690	3,890	6,580
						913			1,777					
S-AF9M Sawt. Poles	400		20	300		300		40	1,000	20		2,400	2,080	4,480
						900			1,500					
S-AF9P Sawt. Poles	200			200		300		30	500	20		1,500	1,250	2,750
						500			1,000					

(Continued next page)

Colville N. F.
Colville District
Sullivan Lake District

TABLE 8, continued - AVERAGE STAND PER ACRE IN POLE AND SAWTIMBER STANDS
BY TYPES AND STAND-SIZE CLASSES
- National Forest -

Type Strata	Species													
	WP	PP	WL	DF	GF	AF	Cedar	Hem.	E. Spruce	LPP	Hdw.	Pole	Sawt.	Total
C-GF-H9W Sawt. Poles	662		37	226		286	916	2,034	838				4,999	5,762
	182				191	179		211				763		
C-GF-H9M Sawt. Poles	205			383	97	770	220	1,600	390			307	3,665	3,972
					109	115	83							
C-GF-H9P Sawt. Poles	75		74	100	100	300	50	500	100	20			1,319	1,634
	61		68	35	18	20	81	32				315		
LP8W Sawt. Poles		6	71							94			171	2,295
LP8M Sawt. Poles			102							2,022		2,124		
			10							177		889	187	1,076
LP8P Sawt. Poles			10							879				
		4	11	20	39					14		649	88	737
Hdw9W Sawt. Poles			8	17						624				
Hdw9M Sawt. Poles				50							2,000		2,050	2,550
										500		500		
Hdw9P Sawt. Poles				50							1,500		1,550	1,850
										300		300		

TABLE 8a - AVERAGE STAND PER ACRE BY TYPES AND STAND-SIZE CLASSES 1/

Colville N. F.
Curlew R. D.
Republic R. D.
Kettle Falls R. D.

- National Forest -

Type Strata	Species								
	PP	WL	DF	GF 2/	Cedar	Spruce	LPP	Total	
								Pole	Sawt.
					(M Cubic Feet)				
P9M-Pole	200	-	50	-	-	-	-	250	
Sawt.	2,200	50	400	-	-	-	-	150	2,650
P9M-Pole	100	-	50	-	-	-	-	100	2,900
Sawt.	1,200	40	300	-	-	-	-		1,540
P9P-Pole	50	-	50	-	-	-	-		1,690
Sawt.	800	10	200	-	-	-	-		1,010
L-DF9W									1,110
Pole	-	-	-	404	36	203	69	712	
Sawt.	-	1,113	1,201	61	61	412	-		2,848
L-DF9M									3,560
Pole		89	270	37	-	6	82	484	
Sawt.	152	538	1,136	-	-	48	10		1,884
L-DF9P									2,368
Pole	-	22	148	-	-	-	54	224	
Sawt.	24	310	508	-	-	-	9		851
LP8W									1,075
Pole	-	100	300	-	-	-	1,800	2,200	
Sawt.	-	-	-	-	-	-	100		100
LP8M									2,300
Pole	-	200	260	10	-	-	1,200	1,670	
Sawt.	-	10	80	-	-	-	100		190
LP8P									1,860
Pole	-	50	100	-	-	-	800	950	
Sawt.	-	-	-	-	-	-	50		50
									1,000

1/ For types not listed use Colville and Sullivan Lake volumes.

2/ Includes small amount of alpine fir.

TABLE 9 - USABLE CULL VOLUME 1/ (FROM LIVE CULL TREES)
AND SALVAGE VOLUME 1/ (DEAD TREES)

North Idaho
E. Washington

Stratification	Usable Cull (Cords Per Acre)	Salvage	Total
White Pine	4.5	1.0	5.5
Ponderosa Pine	1.0	1.0	2.0
Larch	4.0	1.5	5.5
Douglas-fir	3.0	1.0	4.0
Hemlock-Grand Fir	10.0	1.5	11.5
Englemann Spruce	3.0	5.0	8.0
Cedar	5.0	2.0	7.0

1/ Based on forest survey and national forest information.

TABLE 9a - SALVABLE AND USABLE CULL INVENTORY
(Cords)
- NATIONAL FOREST -

Species	Acres	Usable Cull	Salvage	Total	Percent
W. Pine	6,072	27,324	6,072	33,396	1.5
P. Pine	75,533	75,533	75,533	151,066	6.8
Larch	174,558	698,232	261,837	960,069	43.2
D.-fir	159,514	473,542	159,514	638,056	28.7
C-H-GF	13,766	206,490	48,181	254,671	11.4
S-AF	23,227	69,681	116,135	185,816	8.4
Total	452,670	1,555,800	667,272	2,223,072	100.00

INVENTORY TECHNIQUE AND ACCURACY

The forest inventory technique consists of the use of aerial photos to determine types and densities and the taking of sample plots to determine stand composition and volumes.

On their ten-year revision of the forest inventory, the Intermountain and Rocky Mountain Forest and Range Experiment Stations had established permanent plots in accordance with instructions at the time this survey was made. Their latest instructions were used in taking additional sample plots needed to give a satisfactory sampling error and coefficient variation for the working circle.

Technique - Inventory data of area and volume by stratification on which this management plan is based were compiled from area inventory made by the Colville National Forest. The volume data are based on inventory data compiled from permanent plots established by the Colville National Forest and the Forest Survey.

In brief, the techniques involved are:

- (1) Aerial photo interpreting to determine forest condition classes or strata.
- (2) Checking on the ground and by airplane of the various strata classifications.
- (3) Transferring these strata to planimetric base, two inches to mile.
- (4) Calculating and compiling strata by type, compartment, working circle, and forest.
- (5) Sampling the major strata areas (over 5,000 acres) so that the requirements set forth would be met.
- (6) Multiplying the strata averages by species (volume per acre) for each strata area, compiling these volumes by area for each compartment, working circle, and for the forest.
- (7) Analyzing the sampling error of various species, strata, and working circle.

Accuracy of the Data - In determining the volume and acreage of various strata, there are two sources of error.

- (1) Technique errors - Errors in measuring, recording, and compiling sample plot data and acreage and volume data. These errors were minimized by training and checking of individuals responsible for the field and office work. However, the magnitude of these errors that may be present was not evaluated. It is believed that these errors are considerably less than the sampling errors.

(2) Sampling errors - Sampling errors, unlike technique errors, do not involve human error but are theoretical measurements of the reliability of the estimates based on variability exhibited by the samples. If time and money were not limiting factors, the sampling error could be reduced to zero. However, because time and money are limiting factors, guides have been developed so that major strata would be sampled on about the same intensity. Highlights of analysis of the major stratifications, species, working circle and compartment are as follows:

Statistical Analysis of the Cubic Foot Plot Data
of the Colville Working Circle

<u>Strata</u>	<u>Coefficient of</u> <u>Variation</u> Percent	<u>Sampling Error</u> Percent (1 S.D.)
P9M	34	14
P9P	42	21
Total		12
L-D9W	56	17
L-D9M	48	10
L-D9P	60	13
Total		9
S9	40	20
H9M	55	27
H9W	31	18
Total		15
WL8W	84	38
WL8M	74	44
WL8P	109	64
Total		24
LP8W	28	12
LP8P	82	48
Total		13
Total All		5

The Sampling Error, one standard deviation for board foot, by species is as follows:

WP = 35%

S = 22%

PP = 18%

C)

WL) = 9%

H) = 26%

DF)

GF)

All = 7%

LP = 41%



TIMBER HARVEST PLAN

ACCESS ROAD PLAN

No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals				Estimated non-N.F. timber hailed PM	Description of road, number, name, standard and construction terminal	Amount and kind of work, cost (thousands of dollars) and responsibility												Status of			Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		1960		1961				Kind of work, etc.	FY 1960			FY 1961			FY 1962			FY 1963			FY 1964	Total		N-New const.	R-Reconst.	S-Survey	Design	Rights- of- way																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
		1960	1961	1962	1963				Total	N-New const.	R-Reconst.	S-Survey	Total	N-New const.	R-Reconst.	S-Survey	Total	N-New const.	R-Reconst.	S-Survey																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs: engineering, grading, surfacing, and drainage facilities. Refer to form FS-118, line 26, column 2.
Refer to Road Handbook, page 6-2, paragraphs i and j, for definition of "New construction" and "Reconstruction."

Forest Working circle COLVILLE
Allowable annual cut - NF 12.0 million board feet sawlogs

Calendar NF 1954 1955 1956 1957 1958
Actual cut: NF 5.5 3.4 4.2 10.3 4.3
Other

Responsibility: FS - Forest Service
- Operator
Y - Explain any other responsibility in notes

Prepared by W. B. Howard Date 1/15/59
Approved by W. B. Howard Date 3/5/59
Forest Supervisor

TIMBER HARVEST PLAN				Amount and kind of work, cost (thousand dollars and cents responsibility)										Status of			Notes		
No. on map	Location of timber to be sold	Planned cut by fiscal details			Description of road, number, name, standard and construction terminal	Kind of work, etc.	FY 1960		FY 1961		FY 1962		FY 1963		FY 1964			Survey - Design	Light - way
		1960	1961	1962			1963	1964	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.			
Estimated non-harvested timber hauled per year					Year Amount														

Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form FS-118, line 26, column 2.

Refer to Road Handbook, page 6.8, paragraphs 1 and j, for definitions of "New construction" and "Reconstruction."

Forest Working circle Calville Calville
 Allowable annual cut - NF _____ million board feet
 Actual cut: NF _____
 Other _____

Prepared by _____ Date _____
 Approved by _____ Date _____
 Forest Supervisor

-Responsibility: FS - Forest Service
 O - Operator
 X - Explain any other responsibility in notes

TIMBER HARVEST PLAN

ACCESS ROAD PLAN

N. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals				Estimated non-N.F. timber hauled by year	Description of road: number, name, standard and construction terminal	Kind of work, etc.	Amount and kind of work, cost (Thousands of dollars) and responsibility												Status of			Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form FS-118, line 26, column 2.

Refer to Road Handbook, page 6-8, paragraphs 1 and 2, for definitions of "New construction" and "Reconstruction."

Forest COLUMBIA
Working circle COLUMBIA
Allowable annual cut - NF 10.5 million board feet sawlogs

Calendar
Actual cut: NF 12.3 1954 19.55 1955 19.57 1956 19.57 1958
Other 12.3 1954 19.55 1955 19.57 1956 19.57 1958

Responsibility: FS - Forest Service
- Operator
X - Explain any other responsibility in notes

Prepared by W. M. Cory and B. M. Howard Date 10/25/59
Approved by W. M. Cory Date 11/8/59
Forest Supervisor

*Responsibility: FS - Forest Service
O - Operator
X - Explain any other responsibility in notes

TIMBER HARVEST PLAN

No. on map	Location of timber to be sold	Planned cut by fiscal years, million and decimals		Estimated non-N.F. timber hauled per year	Description of road: number, name, standard and construction term	Kind of work, e.g.	A. Unit and kind of work, cost (thousand dollars) and responsibility												Status of		Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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TIMING HARVEST PLAN				Amount and kind of work, cost (thousands of dollars) and responsibility																				Status of			Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals		Estimated non-N.F. timber hauled by year	Description of road: number, name, standard and construction and terminal	FY 1960		FY 1961		FY 1962		FY 1963		FY 1964		Surveys	Design	Right-of-way																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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58	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299

Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form FS-118, line 26, column 2.

Refer to Road Handbook, page 628, paragraphs i and j, for definitions of "New construction" and "Reconstruction."

Responsibility: FS - Forest Service

0 - Operator
X - Explain any other responsibility in notes

Prepared by _____ Date _____

Approved by _____ Date _____
Forest Supervisor

Forest Supervisor



TIMBER HARVEST PLAN										ACQUISITION PLAN										Status of			Notes
No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals				Estimated non-S.F. timber hailed PS Year Amount	Description of road, number, name, standard and construction terminal	Kind of work, etc.	Amount and kind of work, cost (thousands of dollars) and responsibility														
		1960	1961	1962	1963				1964	FY 1960		FY 1961		FY 1962		FY 1963		FY 1964					
										Total	Reconstr.	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.	Total	Reconstr.
(10)	INDEPENDENCE							Length, miles											NEED CHECK TO POSSIBLE WAYS TO APPROACH THE DRAINAGE. WATER DRAINAGE ON ROUTE MOST DESIRE.				
								Grading cost															
								Surfacing cost															
								Bridges cost															
								Total cost															
	MISCELLANEOUS	1.5	2.4	1.3	1.0	2.0		Length, miles															
								Grading cost															
								Surfacing cost															
								Bridges cost															
								Total cost															
	STUD MATERIAL	13.8	19.0	19.0	19.0	19.0		Length, miles															
								Grading cost															
								Surfacing cost															
								Bridges cost															
								Total cost															
		1.0	1.0	1.0	1.0	1.0		Length, miles															
								Grading cost															
								Surfacing cost															
								Bridges cost															
								Total cost															
								Length, miles															
								Grading cost															
								Surfacing cost															
								Bridges cost															
								Total cost															

Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form PS-118, line 26, column 2.

Refer to Road Handbook, page 628, paragraphs 1 and 2, for definitions of "New construction" and "Reconstruction."

Forest Working circle Colville (Kettle Falls)
Allowable annual cut - million board feet

Actual cut: NF 19 19 19 19
Other

Responsibility: PS - Forest Service
Operator
X - Explain any other responsibility notes

Prepared by Date
Approved by Forest Supervisor

TIMBER HARVEST PLAN

ACCESS ROAD PLAN

No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals				Estimated non-S.F. labor hauled per year	Description of road, number, name, standard and construction and terminal	Amount and kind of work, cost (thousand \$ of dollars) and responsibility												Status of		Notes	
		1960	1961	1962	1963			1964	Total	N-New const.	R-Reconst.	Total	N-New const.	R-Reconst.	Total	N-New const.	R-Reconst.	Total	Surveys	Design	Right-of-way		
	TROUT CREEK AND GOODRICH	2.0	2.0				#652 Goodrich Project #3914 Sec 15 T36N., R32E to Sec 2 T38N., R32E S114	1.0	x 0											COMPLETE	CLEAR	Need to check where road can be terminated.	
	BACON CREEK		.5				No Roads																
	IRON MOUNTAIN	2.5	1.0				No Roads																
	TIMBER RIDGE	4.5	2.5	3.5	1.5		#379 Braeken Creek Forest Boundary to NE 1/4, Sec.27 T37N R34E S114	2.0	2.0	0										COMPLETE	N.F.		
	TURNER CREEK	1.0					No Roads																
1	WIKES	1.0	2.0	2.0			#1590 Herren Cr. County Road Sec.12 T37N R32E	2.0	x 0	2.0	x 0												Unit #1 Check on right of way. May need major part cruised.
	WIKES CREEK		1.0	3.0			#1612 Wikes Spur St.Hwy.4 Sec.12 T37N. R32E S114	10.0	x 0	20.0	x 0									NEEDED			
	SOUTH FK. O'BRIEN	2.5	2.5	1.0			#362 Reconstruction 2 miles LU Road Constr. 2 miles			12.0	12.0	0								NEEDED			Reconstruction. Need State Right of Way.
	SCATTER CREEK		2.0	2.0	3.0		#353 Scatter Creek Highway #4 to Swan Lake - BB 26 LU Not assigned	7.7	x FS	2.0	x 0									NEED			Survey on LU Road Needed. Have cruise. No right of way.
	SOUTH SAN POIL				2.0	2.0	#377 So. Fork San Poil County Road, Sec. 2 T36N R34E, 4 miles 2 miles LU Roads S114	158.0	x FS		6.0	x 0											NEEDS RIGHTS OF WAY
	MIDDLE FORK SAN POIL					2.0	#1552 N. Fk. San Poil Road 379 to Center Sec. 33 T37N R34E S114																NEEDS RIGHTS OF WAY

Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form FS-118, line 26, column 2.

Refer to Road Handbook, page 628, paragraphs i and j, for definitions of "New construction" and "Reconstruction."

Forest - GOV/HARP
Working circuit - GOV/HARP
Allowable annual cut - NF 11.0 million board feet sawlogs.

Actual cut: NF 19.54 1955 1956 1957 1958
Other 8.4 8.7 4.0 5.0 6.9

*Responsibility: FS - Forest Service
O - Operator
X - Explain any other responsibility in notes

Prepared by Will Long 7-13 Howard Date 2/18/59
F. W. Cory and W. S. Howard

Approved by W. S. Howard Date 2/18/59
Forest Supervisor

TIMBER HARVEST PLAN					ACCESS ROAD PLAN																	Status of		Notes			
No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals			Estimated non-N.F. timber hauled FY	Description of road: number, name, standard and construction term	Amount and kind of work, cost (thousands of dollars) and responsibility																				
		1960	1961	1962			1963	1964	FY 1960	N-New const.	Reopen.	Total	FY 1961	N-New const.	Reopen.	Total	FY 1962	N-New const.	Reopen.	Total	FY 1963				N-New const.	Reopen.	Total
						Year	Amount	#462 Hall Creek Reconstruction 3 miles SL 14 #1576 From Hall Cr. Rd. to Sec. 9 T35N, R34E 1.5 MI. SLM	Length, miles																		
									Grading cost																		
									Surfacing cost																		
									Bridges cost																		
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TIMBER HARVESTING PLAN

ACCOUNTS AND PLAN

No. on map	Location of timber to be sold	Planned cut by fiscal years, millions and decimals				Estimated non-N.F. timber hauled by year	Description of road, number, name, standard and construction and construction terminus	Amount and kind of work, cost (in thousands of dollars), and responsibility												Status of			Notes	
		1.60	1.61	1.62	1.63			1.64	Kind of work, etc.	FY 1.60		FY 1.61		FY 1.62		FY 1.63		FY 1.64		Surveys	Design	Rights-of-way		
										Total	N-New const.	Respons.	Total	N-New const.	Respons.	Total	N-New const.	Respons.	Total					N-New const.
	JOHNS CREEK	5.0	5.0	2.0			#564 from #302 to John's Creek Sec 3 T39N., R46E. (SN 14) Sec. 3 to Divide to Concho Gulch Hall 1/2 mi.	Length, miles Grading cost Surfacing cost Bridges cost Total cost	6.3 1.1 1.8 0												COMPLETE	N.F.		
	FLUME CREEK	.5						Length, miles Grading cost Surfacing cost Bridges cost Total cost														COMPLETE	CLEAR	Spring Sale
	RUSSIAN CREEK	.3						Length, miles Grading cost Surfacing cost Bridges cost Total cost																Spring Sale
	HARVEY CREEK	2.0					#574 N.F.K. Harvey Re. SN 14 Const. SL 12 Road N. 321 to Sec. 23 T. 38 N R46E	Length, miles Grading cost Surfacing cost Bridges cost Total cost	3.5 0.4 1.0												COMPLETE	N.F.		
	THUNDER	.5						Length, miles Grading cost Surfacing cost Bridges cost Total cost																Spring Sale
	UPPER GITY	1.0	3.0				Extension of #323 Gypsy-Leola SN 14 Sec. 7. T39N. R45E Sec. 5. T39N. R45E	Length, miles Grading cost Surfacing cost Bridges cost Total cost	1.0 0	1.5 0											SURVEY NEEDED	NONE		
	PAUPAC CREEK	3.0	3.0				567 Extension Paupao-Tloa Road #307 to Cato Sec. 3	Length, miles Grading cost Surfacing cost Bridges cost Total cost	5.0 0	7.5 0												SURVEY NEEDED		
	PAUPAC	1.5	3.0	1.5			Paupao Tloa #567 307 Dry Canyon Sec. 6 T. 37N., R 46E	Length, miles Grading cost Surfacing cost Bridges cost Total cost	2.5 0	2.6 0												LOCATION MADE	N.F.	
	CATO				3.0	2.0	#567 Extension Paupao to Cato Cr.	Length, miles Grading cost Surfacing cost Bridges cost Total cost	23.0 0	24.0 0												NEED SURVEY	N.F.	
#1		2.5					Sec. 2	Length, miles Grading cost Surfacing cost Bridges cost Total cost																
#2	STONEY CREEK				3.0	3.0	#660 Stonery SL12 Road #314 to Jack Creek	Length, miles Grading cost Surfacing cost Bridges cost Total cost	1.5 0													NEED SURVEY		.5 mi.

Note: If a sale requires the construction of more than one road or if one road serves more than one sale, use one horizontal space across the form for each sale or each road involved.

Total cost must include all costs; engineering, grading, surfacing, and drainage facilities. Refer to form PS-118, line 26, column 2.

Refer to Road Handbook, page 6.8, paragraphs i and j, for definitions of "new construction" and "reconstruction."

Forest: SULLIVAN
Working circle: CONVILLE, SULLIVAN LAKE BLOCK
Allowable annual cut - NF 16.0 million board feet

Calendar Actual cut: NF 1954 1955 1956 1957 1958
15.1 14.0 15.5 8.2 9.8

Responsibility: FS - Forest Service
Operator

X - Explain any other responsibility in notes

Prepared by: W.C. Conner, 2/13/59 Date: 2/13/59
Reviewed by: W.C. Conner, 2/13/59 Date: 2/13/59
Approved by: W.C. Conner, 2/13/59 Date: 2/13/59

A study was made during 1956 by D. Graham of the Inland Empire Research Center of the Intermountain Forest and Range Experiment Station of dwarfmistletoe infection. The study included all blocks in the Colville Working Circle except Sullivan Lake.

TABLE 11a - Dwarfmistletoe Damage Along Roadsides

District	Percentage of Infection Based on Distance Traveled ^{1/}			All Species Basis Infection	
	DF	WL	LPP	Miles	Percent
	Percent	Percent	Percent		
Republic	86	84	43	160	85
Curlew	78	78	17	88	79
Kettle Falls	78	92	23	200	72
Colville	48	79	23	104	74
All districts	76	86	25	551	77

^{1/} The percentage of dwarfmistletoe infection is based on the total distance traveled (miles) with distances recorded to the nearest one-tenth mile.

DWARFMISTLETOE PLOT SURVEYS

TABLE 11b - Percentage of Infection in Merchantable
Stand from 400 Sample Plots ^{1/}

District	Douglas-fir		Western larch	
	No. of trees infected	Bd. ft. Vol. infected	No. of trees infected	Bd. ft. Vol. infected
	Percent	Percent	Percent	Percent
Republic	78	84	92	94
Curlew	69	73	86	93
Kettle Falls	80	84	90	91
Colville	66	65	92	89
All districts	74	80	90	92

^{1/} Includes dead standing trees that showed signs of having had dwarfmistletoe.

TABLE 11c - Percentage of Infection in Nonmerchantable
Stand from 400 Sample Plots

District	Percentage of Total Trees Infected or Dead with Dwarfmistletoe					
	Douglas-fir			Western larch		
	Large pole	Small pole	Saplings	Large pole	Small pole	Saplings
	Percent	Percent	Percent	Percent	Percent	Percent
Republic	51	40	26	79	58	33
Curlew	57	47	41	67	56	36
Kettle Falls	54	44	27	70	50	29
Colville	36	25	9	91	87	80
All districts	51	41	28	76	60	39

The following from the original are not reproduced here:

Table showing		Compartment Numbers and Names
"	"	Timber Sale Areas--Going Sales and Proposed Sales Planned for Next 5 Years in Million Board Feet
"	"	Current Determination of Plantable Acres and Planned 5-Year Planting Program
Map	I	" Compartment Number and Names by Blocks
"	II	" Timber Flowage for Sales Planned Next 5-Year Period
"	III	" Five-Year Sale and Road Plan
"	IV	" Planting Index
"	V	" K-V and Blister Rust Control
"	VI	" Fire
"	VII	" Recreational and Other Restricted Use Areas

Marking Guides Covering:

General Objectives
Douglas-fir
Ponderosa Pine
Western Larch--Douglas-fir Type
Lodgepole Pine
Engelmann Spruce-Alpine Fir Type
Western White Pine



